August 2010

Sirius SAT

Built-in User Module Fitted for a Domestic Hot Water Storage Boiler
RA – RA2Z
Installation and Operating Manual

Working towards a cleaner future

POTTERTON COMMERCIAL
heating specialists

TO THE OWNER OF THIS POTTERTON COMMERCIAL APPLIANCE

We are confident your new **POTTERTON COMMERCIAL** appliance will meet all your requirements.

All **POTTERTON COMMERCIAL** products have been designed to give you what you are looking for: good performance combined with simple and rational use.

Please do not put away this booklet without reading it first as it contains some useful information which will help you to operate your appliance correctly and efficiently.

Attention: Do not leave any packaging (plastic bags, polystyrene, etc.) within reach of children, as it is a potential source of danger.

CONTENTS

1. Description 4
2. Instructions prior to installation 4

INSTALLATION INSTRUCTIONS: HYDRAULIC CONNECTIONS

3. Centralised system requirements 5
4. Mounting the template casing 9
5. Mounting the appliance 10
6. Connecting the storage boiler 11
7. Output/pump head performance 13
8. Domestic hot water production 13
9. Domestic water meter 14

INSTALLATION INSTRUCTIONS: ELECTRICAL CONNECTIONS

10. Electrical connections 15
11. Wiring diagrams 16
12. Electrical connections to the storage boiler 18
13. Connecting the ambient thermostat 21
14. Connecting the floor overheating thermostat 22
15. Installing and connecting the external probe 23
16. Connecting the ECO CRONO climate controller 24
17. Adjusting the electronic board 24

INSTALLATION INSTRUCTIONS: HEAT METERING

18. Heat metering 28
19. Automatic measurement system via radio 29

START-UP AND OPERATING INSTRUCTIONS

20. Filling the system 33
21. Air vent and pump release 33
22. Start-up 34
23. Electronic board signals 35

MAINTENANCE INSTRUCTIONS

24. Cleaning the central heating inlet filter 37

25. Circuit diagram 38
26. Disposal 40
27. Technical specifications 40

INTRODUCTION

The **SIRIUS SAT** user modules make it possible to independently manage heating requirements and the production of domestic hot water with storage in centralised systems, meter the heat distributed to each unit (flat or independently managed area) and transmit heat consumption data via radio.

The following notes and instructions are addressed to fitters to allow them to carry out trouble-free installation.

The operating instructions are contained in the “Start-up and operating instructions” section of this manual.

ATTENTION:

- Do not leave any packaging (plastic bags, polystyrene, etc.) within the reach of children as they are a potential source of danger.
- **The appliance must be housed in the template casing supplied in a separate pack.**
- **Flush the Domestic Hot Water circuit prior to use**.

1. DESCRIPTION

The **SIRIUS SAT** user modules are available in 2 versions:

SIRIUS SAT	Can be connected to storage boiler	dual zone	Circulation pump	Casing kit
SIRIUS SAT RA	●	-	●	**L = 600**
SIRIUS SAT RA2Z	●	●	●	**L = 800**

These models are fitted with circulation pumps which release them from the head generated by the column pump independently feeding the internal heating circuit and the storage boiler coil circuit. They can also be connected to an external storage boiler for the production of domestic hot water.

The dual-zone models can separately manage two heating zones at different temperatures and are ideal for combined central heating systems (underfloor radiant panels at a low temperature with radiators at a high temperature).

2. INSTRUCTIONS PRIOR TO INSTALLATION

These appliances must be inserted in a centralised heating system and connected to a storage boiler, especially designed for this purpose, consistently with their performance levels and power outputs.
The fitter must be legally qualified to install heating appliances.

Initial start-up must be performed by a **POTTERTON COMMERCIAL**-authorised Service Engineer, as indicated on the attached sheet.

Failure to observe the above will render the guarantee null and void.

Do the following before connecting the appliance:

- Carefully flush all the system pipes in order to remove any residual thread-cutting swarf, solder and solvents in the various heating circuit components.

3. CENTRALISED SYSTEM REQUIREMENTS

Some general indications concerning the installation of the centralised heating system are shown below. For these types of plants, a cutting-edge bespoke design compliant with current legislation is always necessary in order to ensure ideal conditions of comfort, save energy and reduce the environmental impact.

Install the boilers in a cascade arrangement (preferably condensation boilers with low pollutant emissions) of a suitable size to optimise plant performance according to seasonal loads, user demand and Domestic Hot Water demand peaks. The maximum installed power must consider a simultaneous use factor so as not to oversize the generator and consequently reduce operating efficiency.

The centralised plant must service the various floors of the building by means of columns positioned in the stairwells or in utility rooms which should preferably be inspectable.
A hydraulic separator should always be fitted downline from the heat generator as this separates circulation in the generator from circulation in the columns.

The centralised plant must have the following features:

- Automatic filling
- Expansion system sized according to total plant capacity
- Overpressure safety valve sized according to current legislation.

Each suitably sized column must be fitted with a circulator (preferably at variable speed depending on the demand of the modules), on/off valves and a dynamic balancing valve. Automatic air vents must be installed at the top of the columns.
The inlet sections must have the same pressure drop in order to allow the system to balance feed to all the user systems.
The recommended typology is three columns with a reverse return line.

Modules with Domestic Hot Water production require an appropriate centralised plant capacity so as to produce a thermal mass that can limit the instantaneous operation of the generator (column oversizing).

THE COLUMNS AND MANIFOLDS MUST BE WELL LAGGED.

Make sure that the circuit pressure drops downline from the module (R = 0.3 KPa/m per linear metre + local leaks) are compatible with the pump supplied together with the module. In this case, the column pump must offset the circuit pressure drops upline from the module (a residue head is acceptable).

SIRIUS SAT user modules are fitted with an automatic by-pass valve which opens the circulation circuit when the pressure drops exceed 60 kPa (inlet valve closed).

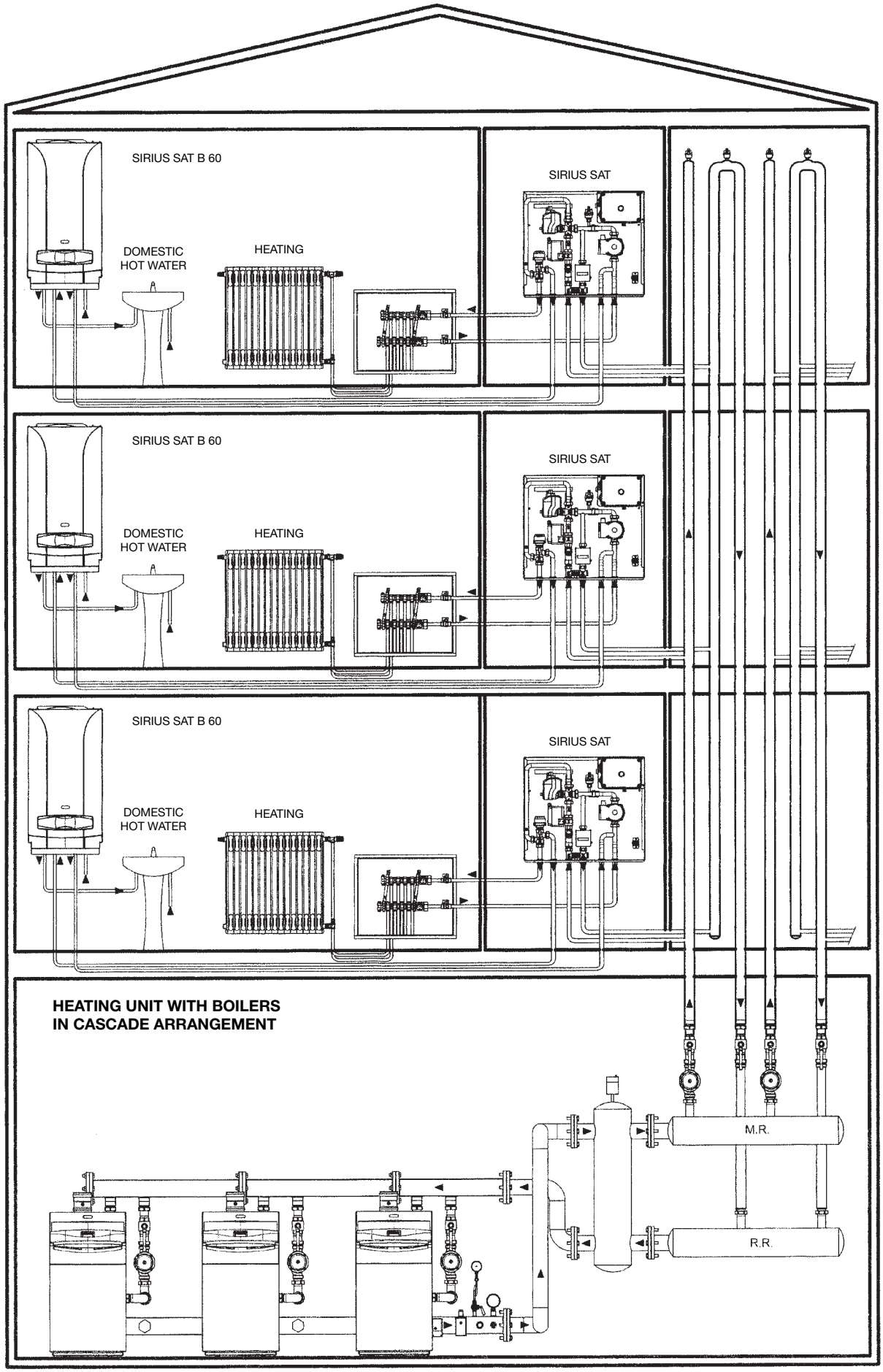


Figure 1a: System diagram

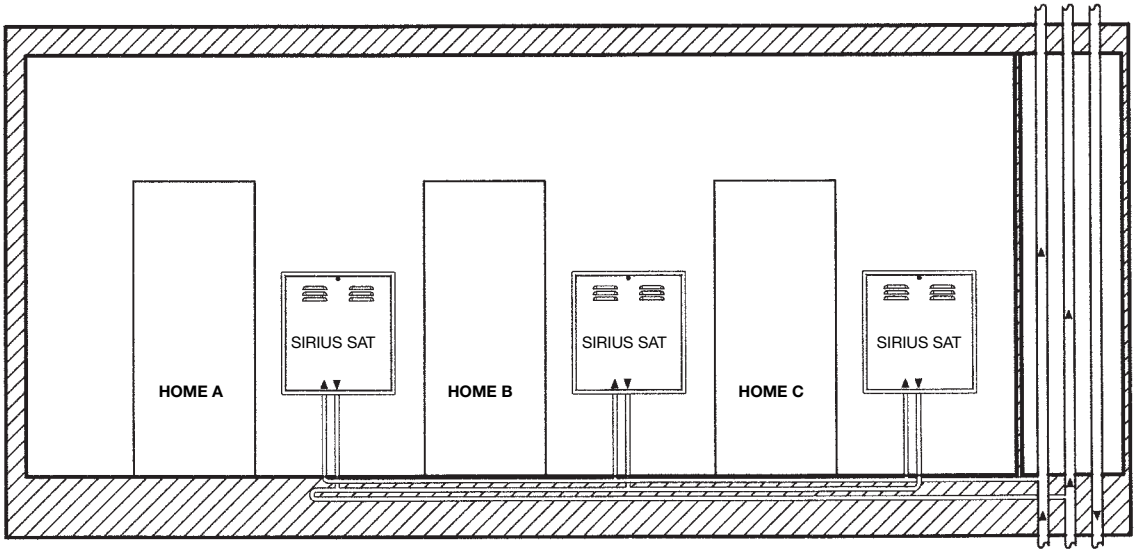


Figure 1b: Floor arrangement diagram

The indicative diagram in figure 1b only illustrates the feed pipes of the individual user modules.
The heating plant inside the zone controlled by the module must be realised by feeding the heating elements according to normal methods.
The storage boiler for the production of domestic hot water must be installed inside the home (or zone) service by the module.
A stub of the mains water supply must be connected to the domestic hot water inlet connector of the storage boiler. The storage boiler hot water outlet must feed all the user hot water take-off points.

3.1 GENERAL SIZING DATA

- **Water temperature range in centralised plant:** **60 - 75 °c**
- **Maximum water pressure in centralised plant:** **4 bar**
- **Module feed flow rate (nominal):** **700 ÷ 1500 l/h**
- **Maximum recommended speed of heat transfer fluid:** **1 ÷ 1.5 m/s**
- **Pressure drop in module** **20 KPa at 700 l/h**

Some purely indicative general sizing data is shown below:

TABLE: HEAT DEMAND – HEATED AREA

Area to heat (m^2)	**Heat demand (*) with F1 = 20 W/m³** (kW)	**Heat demand (*) with F2 = 30 W/m³** (kW)	**Heat demand (*) with F3 = 45 W/m³** (kW)
60	3,6	5,4	8,1
70	4,2	6,3	9,5
80	4,8	7,2	10,8
90	5,4	8,1	12,2
100	6,0	9	13,5
110	6,6	9,9	14,9
120	7,2	10,8	16,2
130	7,8	11,7	17,6
140	8,4	12,6	18,9
150	9,0	13,5	20,3

(*) Volumetric heat load "F": 20 - 30 - 45 W/m³ with Δt = 25 K;
height of volume to be heated = 3 m
Δt = internal and external temperature difference (internal T = 20 °C, external = - 5°C)

F1 = 20 W/m³ buildings with an excellent level of insulation
F2 = 30 W/m³ buildings with an good level of insulation
F3 = 45 W/m³ buildings with an low level of insulation

TABLE: HEAT DEMAND – FLOW OF WATER IN HEATING CIRCUIT
DOMESTIC HOT WATER TAKE-OFF FLOW

Rated heat power for DHW system (kW)	**Flow rate of Heating circuit with ΔT1 = 15 K** (l/h)	**Flow rate of Heating circuit with ΔT1 = 20 K** (l/h)	**Flow rate of Heating circuit with ΔT2 = 35 K** (l/min)
7 (R)	401	301	2,9
8 (R)	459	344	3,3
9 (R)	516	387	3,7
10 (R)	573	430	4,1
11 (R)	631	473	4,5
12 (R)	688	516	4,9
13 (R)	745	559	5,3
14 (R)	803	602	5,7
15 (RS)	860	645	6,1
16 (RS)	917	688	6,6
17 (RS)	975	731	7,0
18 (RS)	1032	774	7,4
19 (RS)	1089	817	7,8
20 (RS)	1147	860	8,2
21 (S)	1204	903	8,6
22 (S)	1261	946	9,0
23 (S)	1319	989	9,4
24 (S)	1376	1032	9,8
25 (S)	1433	1075	10,2
26 (S)	1491	1118	10,6
27 (S)	1548	1161	11,1
28 (S)	1605	1204	11,5
29 (S)	1663	1247	11,9
30 (S)	1720	1290	12,3

ΔT1 = Difference between User Module Delivery – Return Temperature
ΔT2 = Difference between hot water outlet – cold water inlet temperature
R = heating
S = DHW

4. MOUNTING THE TEMPLATE CASING

CASING/TEMPLATE MODEL	*WIDTH*	*SIRIUS SAT MODELS*
SINGLE-ZONE SIRIUS SAT KIT	**L = 600 mm**	**RA**
DUAL-ZONE SIRIUS SAT KIT	**L = 800 mm**	**RA2Z**

Install **SIRIUS SAT** model inside the casing/template supplied in a separate pack.

Make sure the template casing model is correct (L= 600 or L=800 mm).

Fit the template/casing in a niche in the wall made for this purpose (dimensions indicated in figures 2 and 3) and secure it with the relative lateral bent pins. Make sure the installation allows easy access for maintenance.
Remove the door and white frame and put back after installation (make sure the casing accessories also include the key for opening the door).
The frame can be depth-adjusted by using the 4 butterfly nuts located in the side guides. It is therefore possible to fit the frame flush against the plaster and remove it when painting the wall.

Assemble the system starting from the position of the water connectors on the lower crossbar of the template (recessed into the casing by 30 cm).
Install the casing in the stairwell outside the apartment to heat.

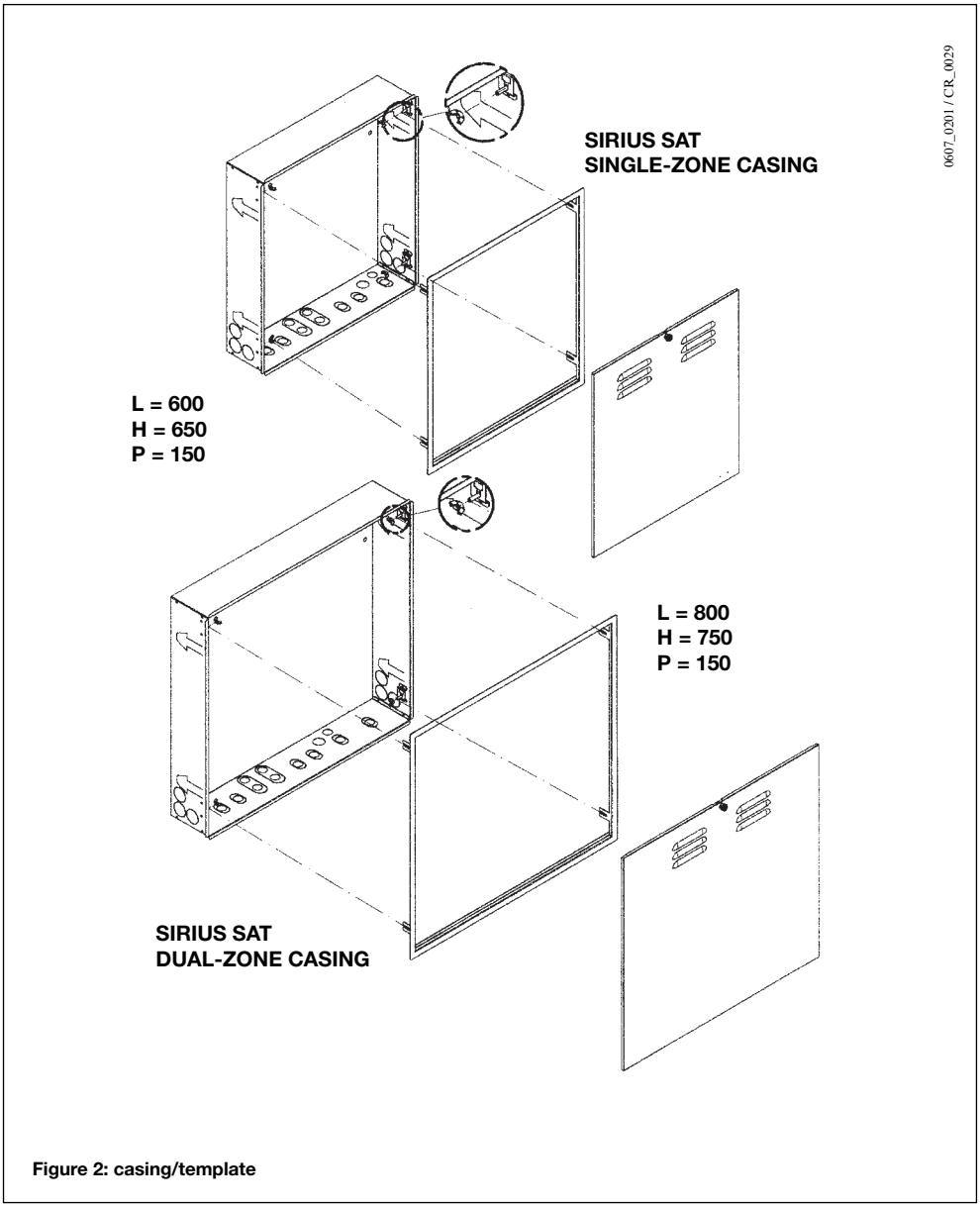


Figure 2: casing/template

5. MOUNTING THE APPLIANCE

After completing the masonry work, hook the SIRIUS SAT module onto the casing/template and make the hydraulic connections using the supplied telescopic connections (see figure 3).
Before fixing the module, drill holes in the rear wall for the Ø 10mm expansion grips (use the holes in the casing/template as a guide). Then secure the module with the supplied screws.

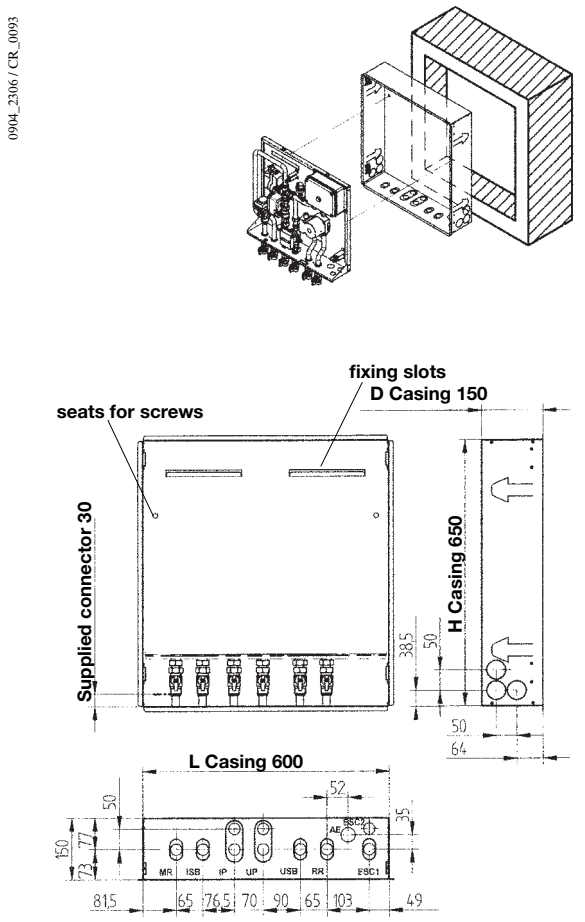


Figure 3 A: connectors and sizes of SIRIUS SAT RA

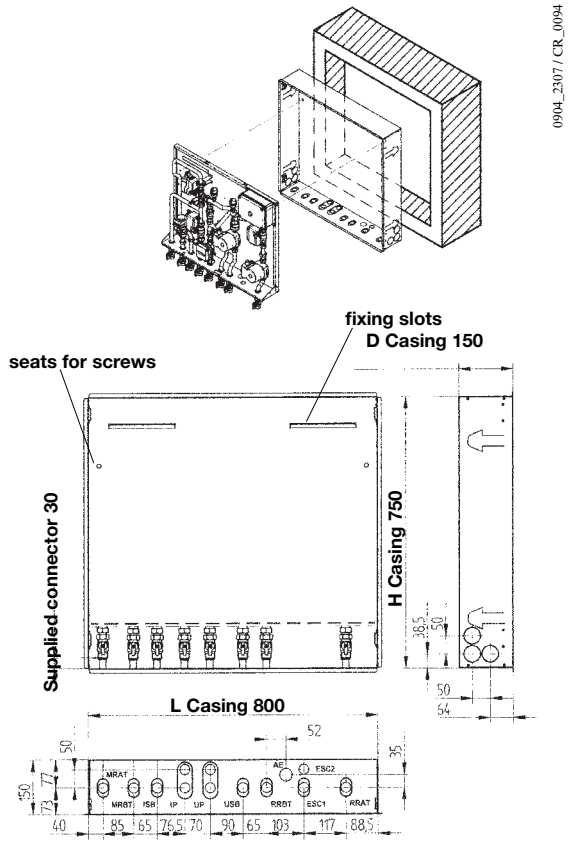


Figure 3 B: Connectors and sizes of SIRIUS SAT RA2Z

Key
CONNECTIONS TO CENTRALISED PLANT

IP: primary inlet from centralised plant G 3/4" M
UP: primary outlet from centralised plant G 3/4" M

HEATING PLANT CONNECTIONS FOR SINGLE-ZONE MODELS

MR: G 3/4" M heating plant delivery
RR: G 3/4" M heating plant return

HEATING PLANT CONNECTIONS FOR DUAL-ZONE MODELS

MRAT: high temperature plant delivery G 3/4" M (Models RA2Z)
MRBT: low temperature plant delivery G 3/4" M (Models RA2Z)
RRAT: high temperature plant return G 3/4" M (Models RA2Z)
RRBT: low temperature plant return G 3/4" M (Models RA2Z)

CONNECTIONS TO STORAGE BOILER COIL CIRCUIT

USB: Storage boiler coil outlet G 3/4 " M
ISB: Storage boiler coil inlet G 3/4 " M

DOMESTIC WATER METER CONNECTIONS

ESC1 (*): domestic water inlet to meter G 3/4" M
ESC2 (*): domestic water outlet from meter G3/4" M

Items in the SIRIUS SAT user module pack

- Screws and expansion grips 10 mm
- Tap G 3/4" user module inlet
- Tap G 3/4" return to centralised plant
- Tap G 3/4" heating plant delivery (2 for dual-zone models)
- Tap G 3/4" heating plant return (2 for dual-zone models)
- Tap G 3/4 " storage boiler coil outlet
- Tap G 3/4 " storage boiler coil inlet
- Gaskets
- Telescopic joints

6. CONNECTING THE STORAGE BOILER

These models can be connected to an external storage boiler fitted with a primary exchanger coil.
The storage boiler must be located inside the home (or zone) served by the module in order to limit the connection distance.
The recommended characteristics for correct application are:

- **coil piping diameter: 26 mm**
- **Heat exchange power: 25 ÷ 30 kW with delivery temperature 75 °C**
- **capacity: 40 ÷ 120 litres**
- **Temperature probe trap:** > 7 mm

A 60-litre stainless steel wall-hung storage boiler is available as an accessory for this application (SIRIUS SAT b60).

Make the hydraulic connections as shown in figure 4.
Connect the ISB (G ¾") connector on the module to the inlet of the storage boiler coil
Connect the USB (G ¾") connector on the module to the outlet of the storage boiler coil

Make sure that the pressure drops in the coil circuit (including the connection parts) are compatible with the flow – pump head curve in figure 5.
To ensure correct performance, do not decrease below 700 l/h.

0904_2401 / CR_0099

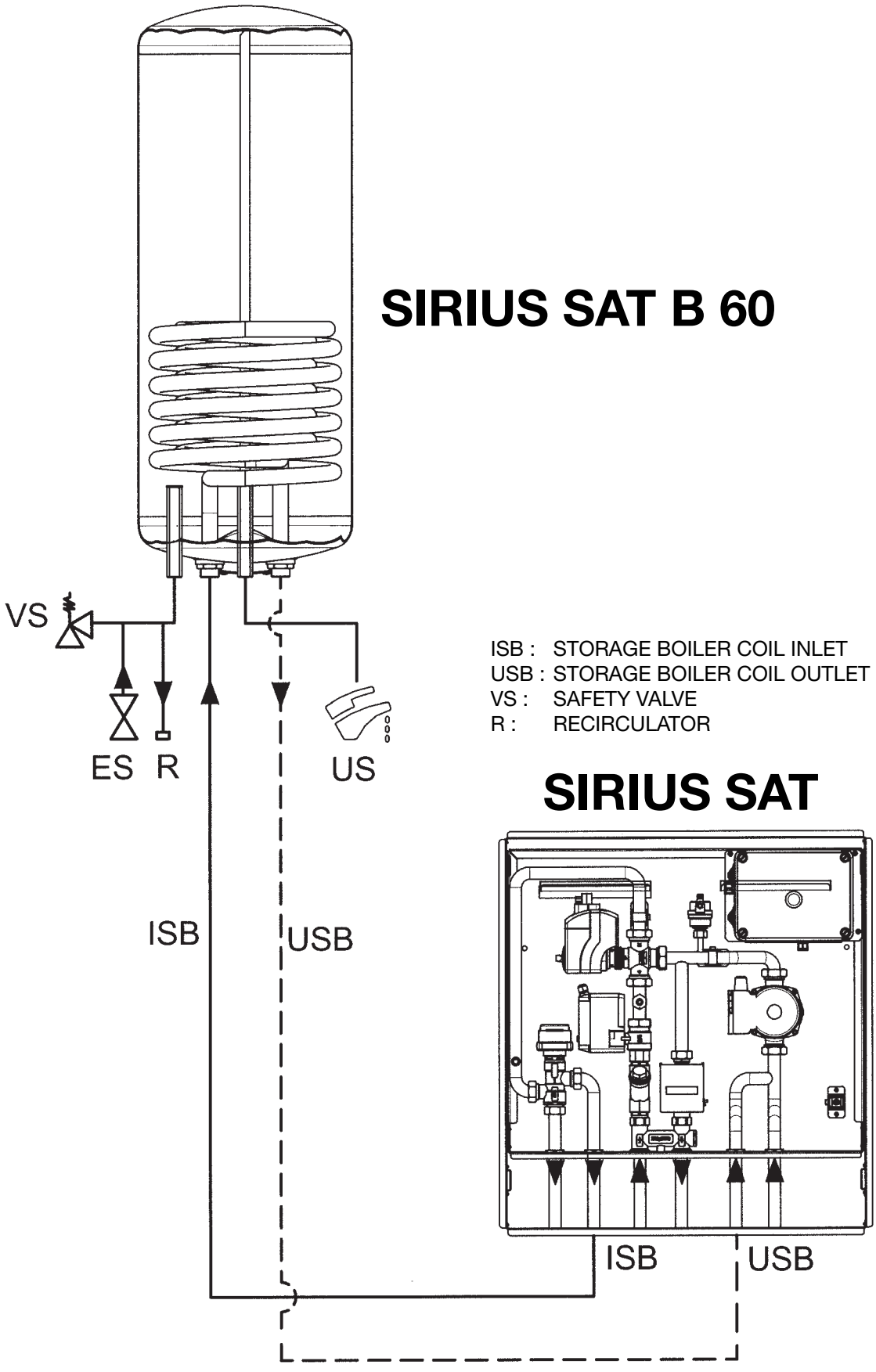


Figure 4: diagram of hydraulic connections to storage boiler

7. PUMP CAPACITY/ HEAD

These models are fitted with a circulation pump.
This silent-running high-head pump is suitable for use on any type of heating system.
The pump, mounted inside the appliance, is fitted out for operation at maximum speed (III). Speed I should not be used as flow rate/head performance does not satisfy normal operating conditions. make sure the circuit pressure drops down-line from the module are compatible with the supplied pump. In this case, the column pump must only offset the circuit pressure losses upline from the module (a residue head is acceptable).
The circulating flow rate value is shown on the heat meter display (see §18).

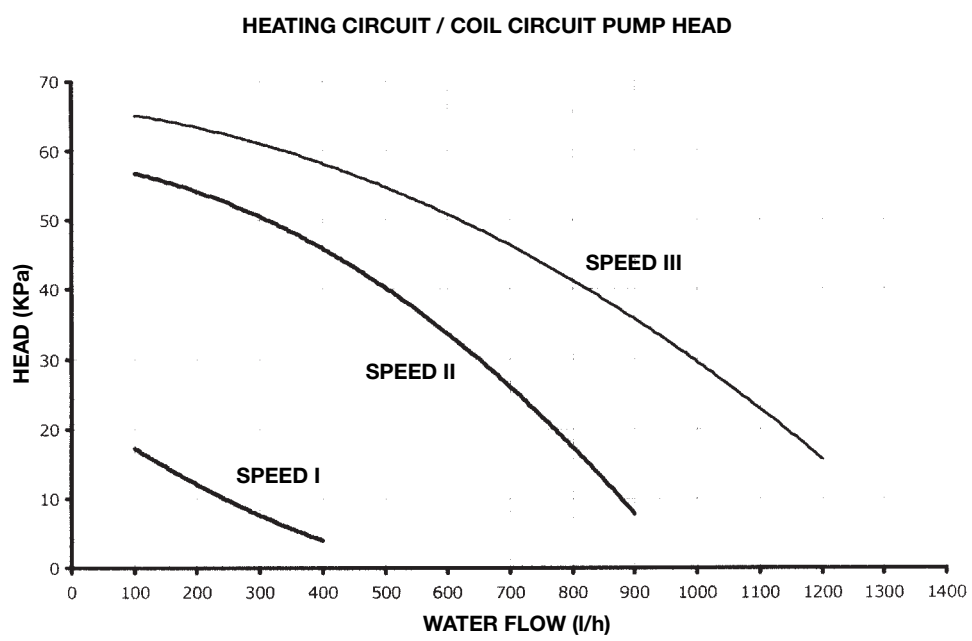


Figure 5: Flow rate – Pump head curves

8. DOMESTIC HOT WATER PRODUCTION

The production of domestic hot water depends on the performance of the storage boiler (heat exchange surface of coil and capacity), the length of the connection and the operating temperature of the central heating system.
A heat exchange surface of 35 kW (with system water at 75°C) offers suitable domestic hot water performance also with system water at 65 °C.

Table: Domestic hot water production according to inlet temperature

Temperature of water in centralised plant circuit (°C)	**Heat exchange capacity** (kW)	**Domestic hot water flow with ΔTs = 35 K** (l/min)
75	35	14,3
70	31	12,7
65	28	11,4
60	26	10,6

ΔTS = temperature difference between hot water outlet and cold water inlet

Temperatures greater than 75 °C are not recommended in order to prevent damaging scale deposits that can clog the coil, reduce performance and shorten maintenance intervals.

9. DOMESTIC WATER METER (available on request)

A meter kit for measuring water consumption is available as an accessory.

- **Domestic water meter KIT for models: RA – RA2Z**

The kit comprises a **SIEMENS WFH36** electronic volumetric meter with display and radio data transmission (featuring the same characteristics as the heat meter: see §18) and two connection pipes housed inside the frame of the user module in the holes made for that purpose.
For further information on the meter, see the supplied SIEMENS instructions**.**

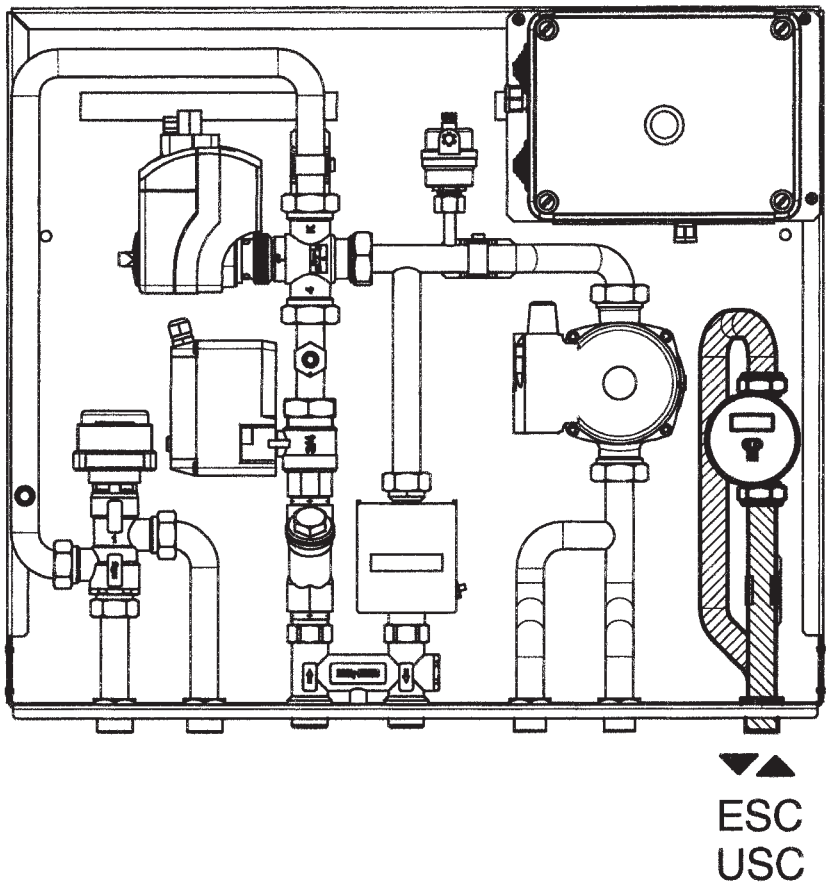


Figura 6: Figure 6: domestic water meter

Domestic water metering inlet: hydraulic connector **ESC1 (G 3/4”**)
Domestic water metering outlet: hydraulic connector **USC (G 3/4”)**

(The USC connector is called **ESC2** in the template casing)

10. ELECTRICAL CONNECTIONS

The appliance is sold complete with electrical connections and power cable.
This machine is only electrically safe if it is correctly connected to an efficient earth system in compliance with current safety regulations.
Connect the appliance to a 230V single-phase earthed power supply using the supplied three-pin cable, observing correct LIVE (L) - NEUTRAL (N) polarity.
Use a double-pole switch with a contact separation of at least 3mm.
When replacing the power supply cable, fit a harmonised HAR H05 VV-F' 3x1 mm2 cable with a maximum diameter of 8 mm.

10.1 ACCESS TO THE POWER SUPPLY TERMINAL BLOCK

- disconnect the appliance from the mains power supply using the two-pole switch.
- remove the door of the casing using the supplied square key.
- make sure that the switch indicator light is off.
- loosen the screws on the cover of the electrical box and remove it.
- The 2A rapid fuses are incorporated in the electronic board.

(L) = LIVE brown
(N) = NEUTRAL blue
⏚= EARTH yellow-green

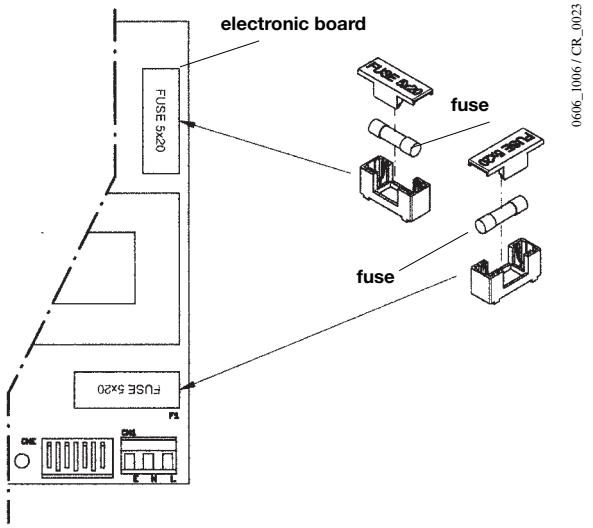
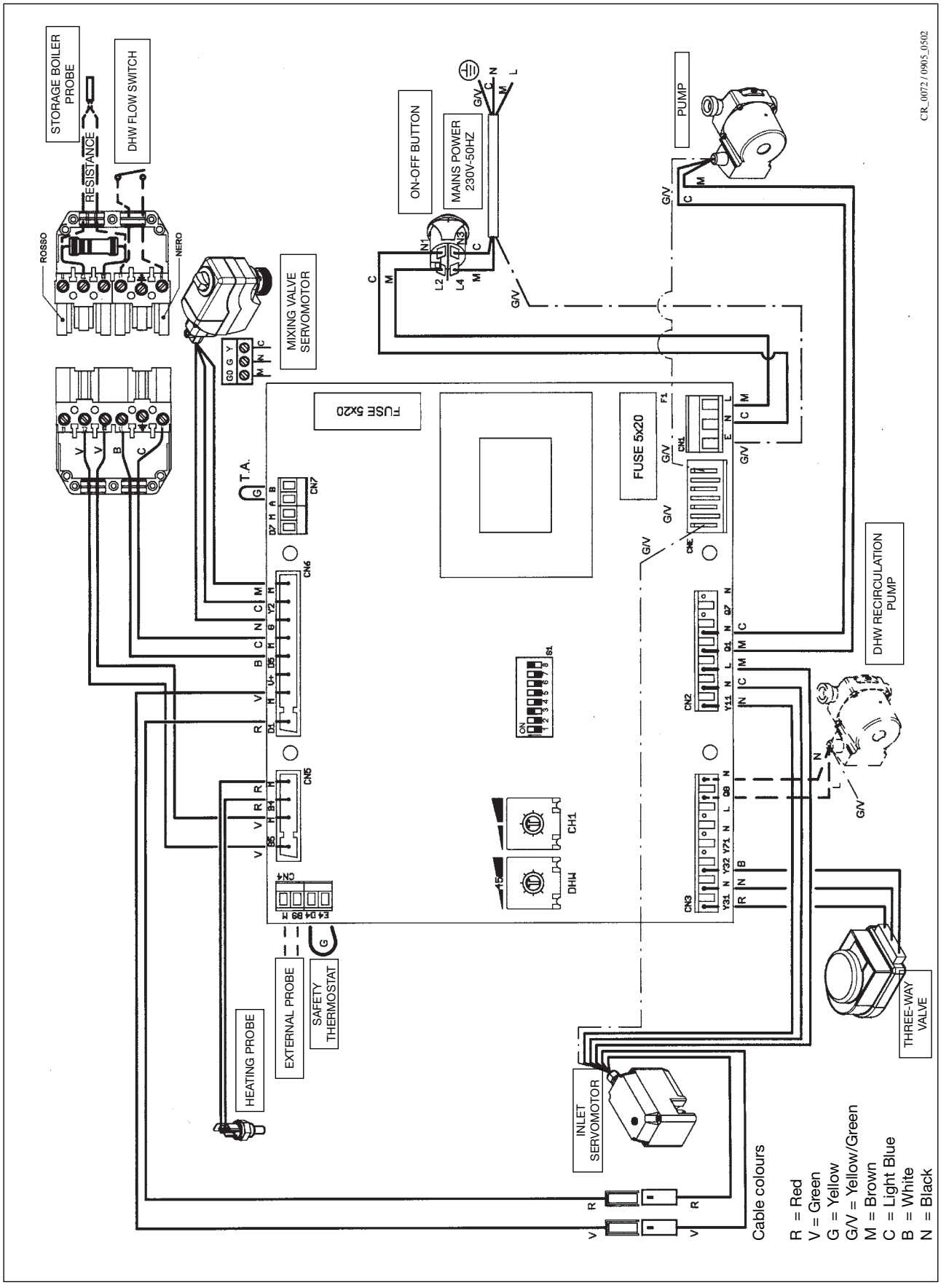


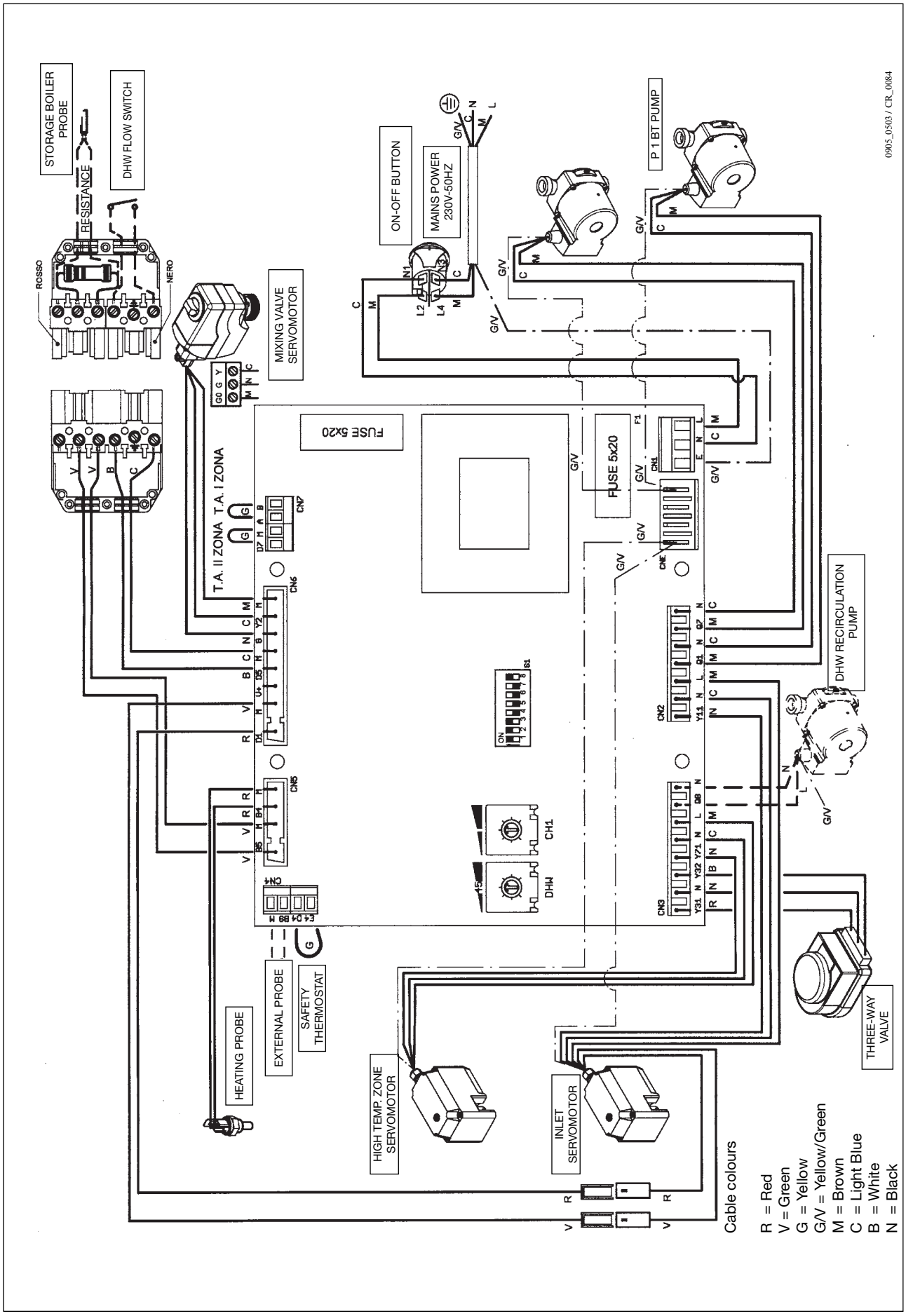
Figure 7: Electric fuses

11. WIRING DIAGRAMS

11.1 MODELS RA



11.2 MODELS RA2Z



12. WIRING THE STORAGE BOILER

Depending on the models, follow the instructions below:

12.1 WALL-HUNG STORAGE BOILER BAXI SIRIUS SAT B60

To electrically connect the storage boiler and the module, proceed as follows, also consulting the instructions supplied with the storage boiler and figure 8:

SIRIUS SAT module
- access the module casing as described in paragraph 10.1.
- After unplugging the appliance, remove the cover of the external connector and the electric heater at the ends of terminals T2 – S3.

SIRIUS SAT B 60 storage boiler
- remove the lower cover of the appliance.
- remove the cover of the external connector.
- Position the RED 3-pin (T1-T2-S3) screw connector in the upper housing and the BLACK 3-pin screw connector (L1 - ⏚ - N) in the lower housing.
- Use a dual-insulated 4-pin cable (standard “HAR VV-F 4x 0.5 mm2 “ cable) to connect the screw connectors in the two appliances:

DHW probe: terminals **T2 - S3**
DHW flow switch: terminals **L1 - N**

- close the covers of the two 6-pin connectors.

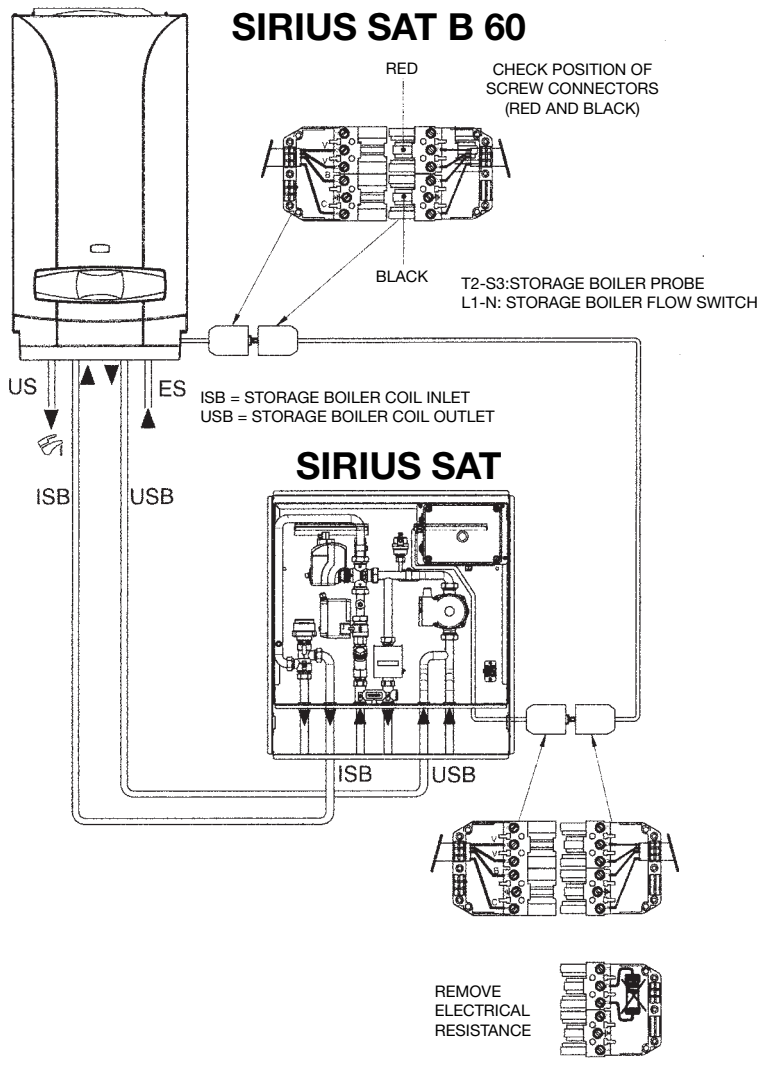


Figure 8: connecting the LUNA SAT B 60 storage boiler

12.2 COMMERCIALLY AVAILABLE STORAGE BOILERS

The diameter of the storage boiler thermostat trap must be greater than 7 mm.
The storage boiler probe and the flow switch, supplied as accessories, must be used for this application.
To electrically connect the storage boiler and the module, proceed as follows, also consulting the instructions supplied with the storage boiler and figure 9:

SIRIUS SAT module
- access the module casing as described in paragraph 10.1.
- After unplugging the appliance, remove the cover of the external connector and the electric heater at the ends of terminals T2 – S3.
- Connect the cable of the storage boiler probe to terminals T2 – S3 (if the cable needs extending, use a standard “HAR VV-F 2x 0.5 mm2 “):
- Use a dual-insulated 2-pin cable (standard “HAR VV-F 2x 0.5 mm2 “ cable) to connect terminals L1-N of the screw connector to the flow switch contacts.

DHW probe: terminals **T2 - S3**
DHW flow switch: terminals **L1-N**

- insert the probe into the storage boiler trap and secure it.
- close the connector cover.

The DHW flow switch must be installed on the domestic hot water inlet pipe.

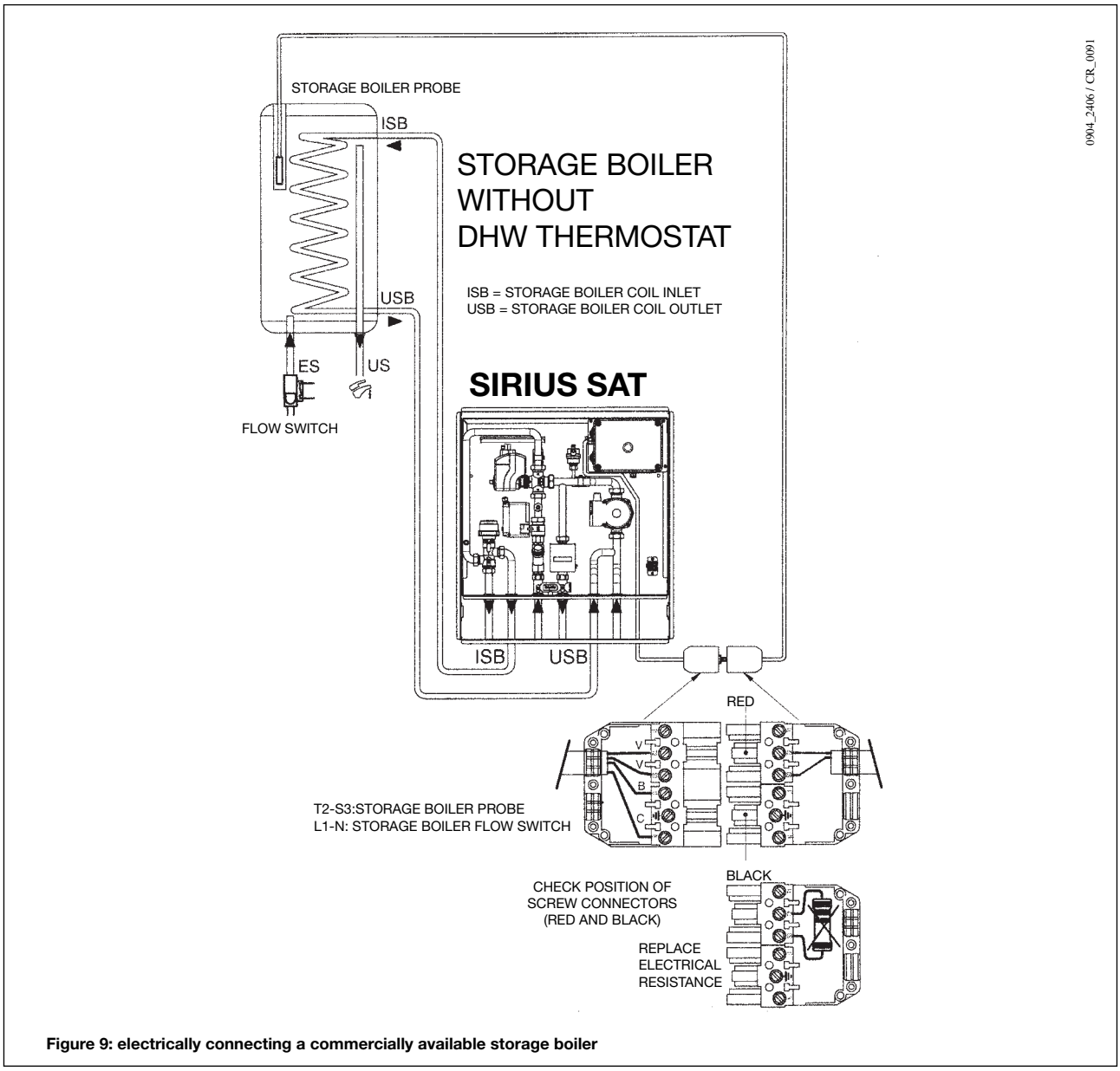


Figure 9: electrically connecting a commercially available storage boiler

12.3 STORAGE BOILER WITH DHW THERMOSTAT (COMMERCIALLY AVAILABLE)

This application is not recommended as it does not allow all the functions on the electrical board of the module (DHW adjustment, anti-legionellosis,…) to be used.
To electrically connect the storage boiler and the module, proceed as follows, also consulting the instructions supplied with the storage boiler and figure 10:

SIRIUS SAT module

- access the module casing as described in paragraph 10.1.

After unplugging the appliance, remove the cover of the external connector and replace the electric heater at the ends of terminals T2 – S3 with the supplied version.

- Use a dual-insulated 2-pin cable (standard “HAR VV-F 2x 0.5 mm2 “ cable) to connect the storage boiler contacts (C – 1) to the terminals L1 – N of the external connector:

Storage boiler DHW thermostat: terminals **L1 - N**

- close the connector cover.

attention: make sure that the storage boiler water temperature (set using the storage boiler thermostat) is set to a lower temperature than that of the system water. Otherwise, the module will not be able to complete heating the water in the storage boiler.

Position the DHW potentiometer (figure 14.B) of the electronic board at the maximum temperature (65°C).

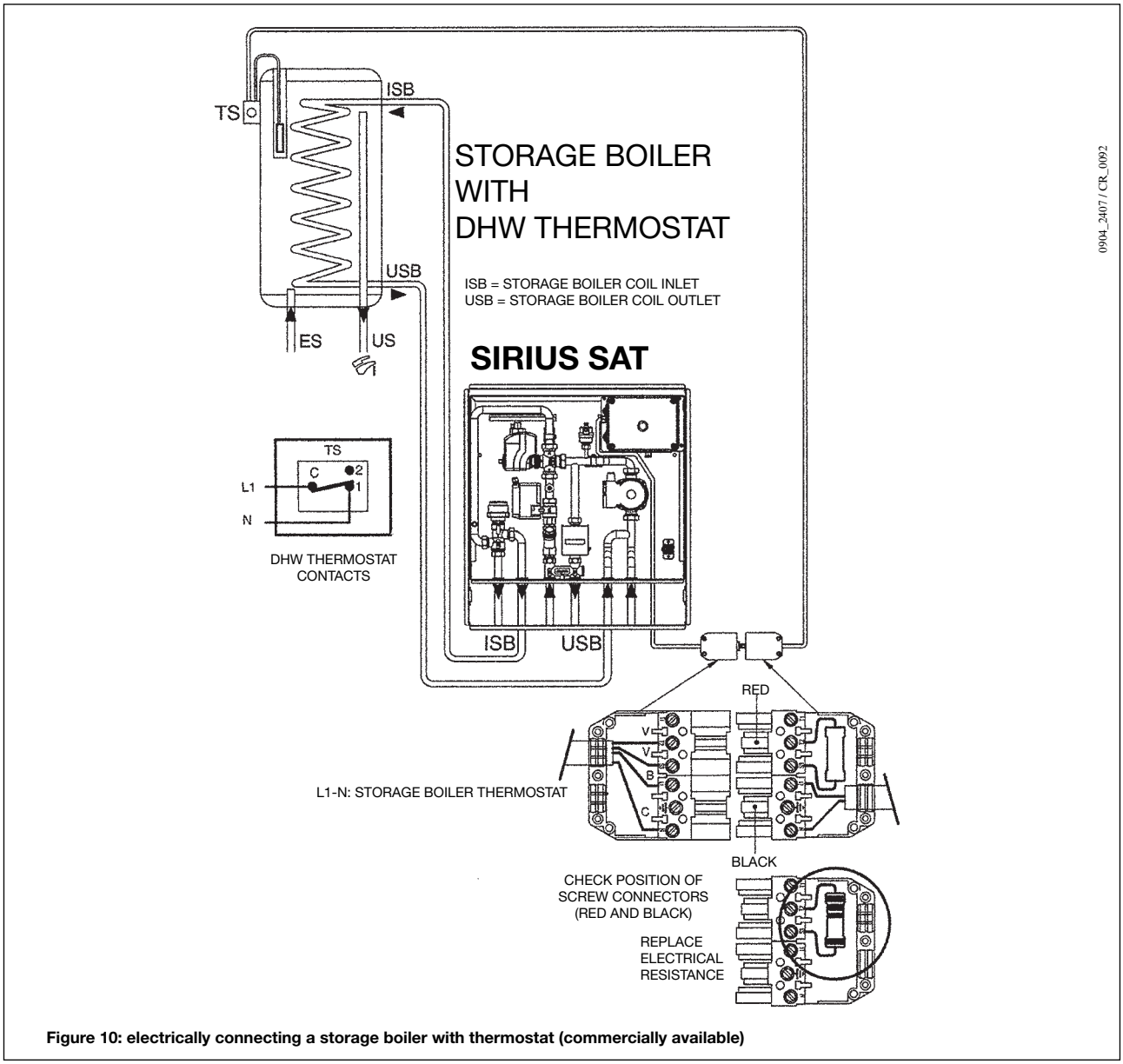


Figure 10: electrically connecting a storage boiler with thermostat (commercially available)

13. CONNECTING THE AMBIENT THERMOSTAT

The system must be fitted with an ambient thermostat for controlling indoor temperature.
To connect this device, proceed as follows:

13.1 SINGLE-ZONE MODELS: RA

- access the electrical components as described in paragraph 10.1.
- remove the jumper on the electronic board terminals (CN7: A - B) (see wiring diagrams in § 11 and Figure 11).
- thread the two-wire cable through the grommets of the electrical box and connect it to these two terminals using a harmonised cable “HAR H05 VV-F” 2 x 0.75 mm2 with a maximum diameter of 8 mm.

13.2 DUAL-ZONE MODELS: RA2Z

These models are fitted for two ambient thermostats in order to provide independent management of two zones at different temperatures.

- access the electrical components as described in paragraph 10.1.
- remove the jumper on the electronic board terminals (CN7: A - B) and (CN7: D7 - M) (see wiring diagrams in § 11 and Figure 11).
- thread 2 two-wire cables through the grommets of the electrical box and connect them to the two terminals using harmonised cables “HAR H05 VV-F” 2 x 0.75 mm2 with a maximum diameter of 8 mm.

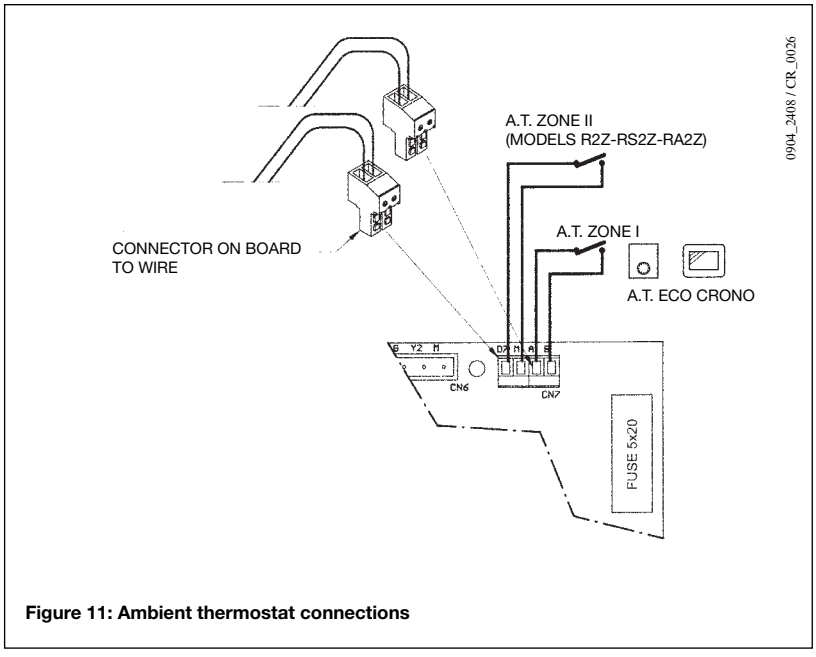


Figure 11: Ambient thermostat connections

14. CONNECTING THE FLOOR OVERHEATING THERMOSTAT

When connecting the user module to a system operating at low temperature, install an off-the-shelf manually resettable contact thermostat (calibrated to 50°C) in order to protect the floor system from elevated temperatures due to possible faults in the adjustment system.
Mount the thermostat on the low temperature delivery line upline from the distribution manifold to the various loops and distant from the user module delivery connector (> 1m).

attention: Make sure low temperature operation is enabled. Electronic board switches 4 and 5 (climate curve switches) must be OFF.

SWITCH 4 = OFF
SWITCH 5 = OFF

LOW CLIMATE CURVE

This selection allows central heating temperature to be adjusted by turning the heating water adjustment potentiometer (**TCH**) on the electronic board. The temperature range is 25 ÷ 40 °C.

Electrical connection of thermostat

- access the electrical components as described in paragraph 10.1.
- remove the jumper on the electronic board terminals (CN4: E4 - D4) (see wiring diagrams in § 11 and Figure 12).
- thread the two-wire cable, coming from the thermostat terminals, through the grommets of the electrical box and connect it to these two terminals (using a harmonised cable “HAR H05 VV-F” 2 x 0.75 mm2 with a maximum diameter of 8 mm).

Safety thermostat tripping

If the safety thermostat trips due to a fault in the adjustment system, the user module stops for safety reasons and the **red LED DL12** shines on the electronic board (see § 23).
After checking the reason for the overheating, restart the system by pressing the safety thermostat reset device and momentarily disconnecting the power supply from the module (this operation is required in order to cancel the block from the board memory: the red LED DL12 flashes).

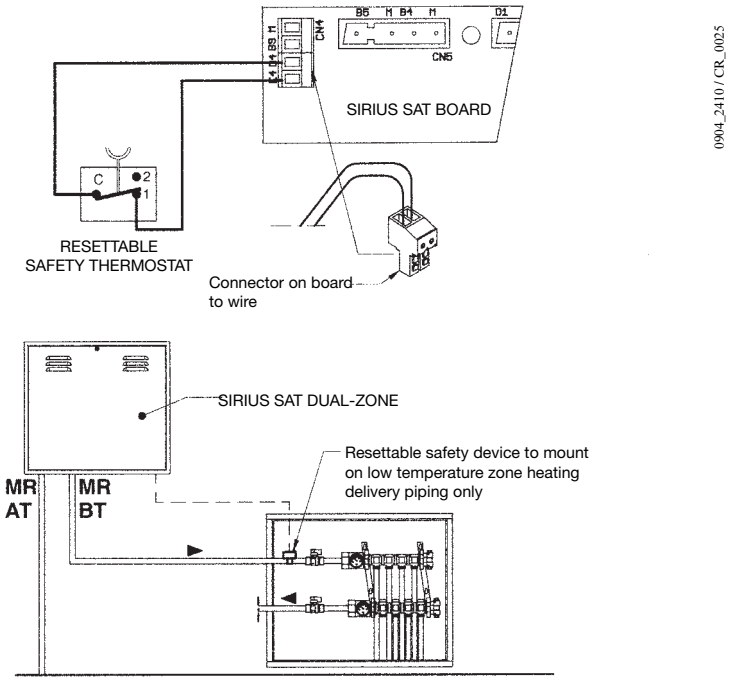


Figure 12: Connecting the low temperature safety thermostat

15. INSTALLING ANC CONNECTING THE EXTERNAL PROBE (accessory available on request)

The appliance is fitted for connection to an external probe, available on request, which independently adjusts delivery temperature depending on the external temperature and the chosen curve.

To mount and electrically connect this accessory, see the figure below and the instructions supplied with the external probe.

The external probe must be installed on a wall outside the building as follows:
- Install on a wall facing north-north/east and protected from direct sunlight.
- Do not install on walls affected by humidity and mould.
- Make sure the wall is sufficiently insulated.
- Do not install near fans, steam outlets or chimneys.

Attach to the wall using the two supplied expansion grips, following the technical instructions supplied with the accessory.

Make electrical connections to the probe using two wires with a minimum cross-section of 0.5 mm² and a maximum length of 20 m (polarity is unimportant).

Fix one end of the Module-Probe connection cable to the probe terminal block, securing it with the relative sealed grommet, and the other end to the screw connector (CN4: B9 - M) on the electronic board (to access the electrical components see section 10.1).

Use a harmonised cable “HAR H05 VV-F” 2 x 0.75 mm² with a maximum diameter of 8 mm.

Only models:
RSP-R2Z-RS2Z

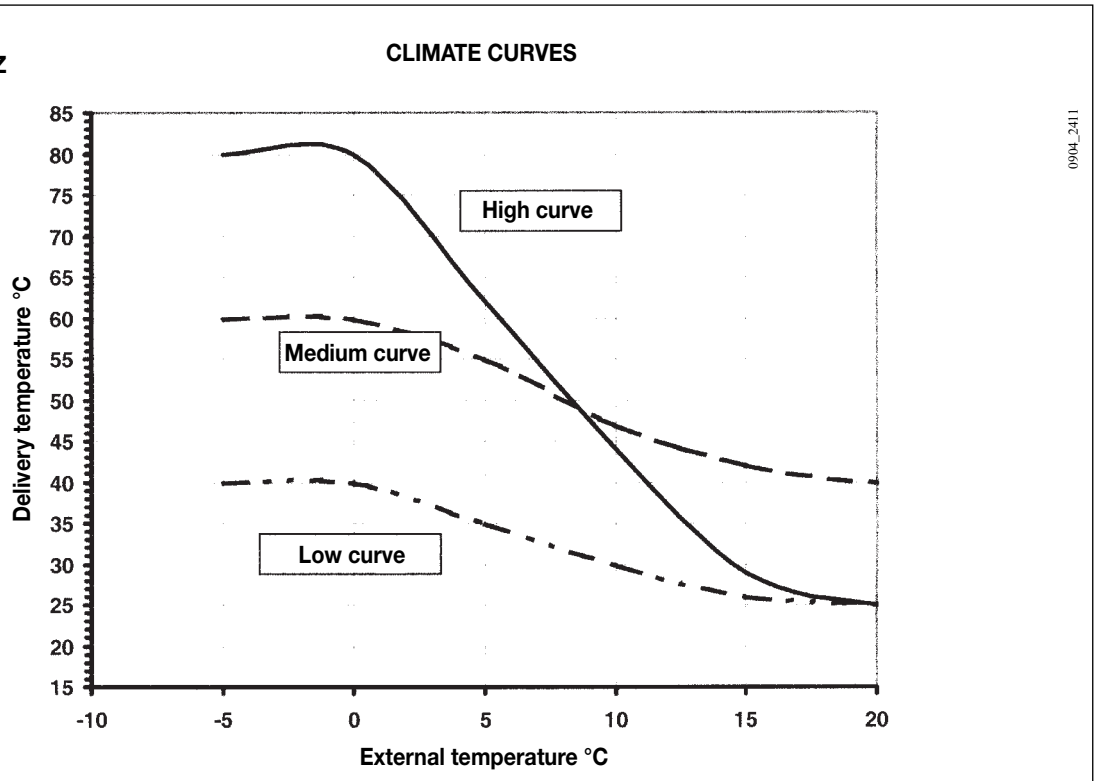
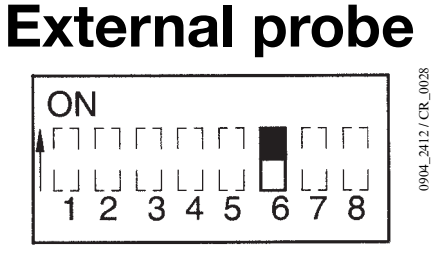


Figure 13: external temperature – delivery temperature performance curve

With the external probe, the **TCH potentiometer** on the electronic board limits maximum heating temperature.

Attention: with the external probe connected, switch 6 on the electronic board must be turned ON.

SWITCH 6 = ON



16. CONNECTING THE CLIMATE ADJUSTER: ECO CRONO (accessory available on request)

The **SIRIUS SAT** module can be remote controlled using the **ECO CRONO** climate adjustor.

Connect the ECO CRONO climate adjustor to the ambient thermostat 1 terminals on the electronic board, as described below:

- Access the electrical components as described in paragraph 10.1.
- Remove the jumper on the electronic board terminals (CN7: A - B) (see wiring diagrams in § 11).
- Connect a two-wire cable to the ECO CRONO terminals (J4:OT). Use a harmonised cable “HAR H05 VV-F” 2 x 0.75 mm^2 with a maximum diameter of 8 mm.
- Introduce the two-wire cable through the grommets of the electrical box and connect it to the electronic board terminals (CN7: A-B). Also consult the manual supplied with the ECO CRONO.

With this device connected, the GREEN LED DL2 on the electronic board flashes at 5s intervals. The instructions supplied with the ECO CRONO climate adjuster also include the information required to:

- Programme user-settable parameters;
- Programme fitter-settable parameters;
- Installation.

17. ELECTRONIC BOARD ADJUSTMENT

Attention: only make adjustments to the electronic board after disconnecting the power supply (see §10: access to live components)

The following adjustment can be made on the electronic board**:**

TR = Heating temperature adjustment potentiometer (CH1)
Adjusts the heating delivery temperature according to the set climate curve.
TR temperature range: 25 ÷ 80°C (see climate curve selection table)

With the external probe, this device acts as a maximum temperature limiting device.

For dual-zone models **(RA2Z),** heating temperature adjustment only applies to the mixed zone. The other zone works directly with the temperature of the inlet water from the centralised system.

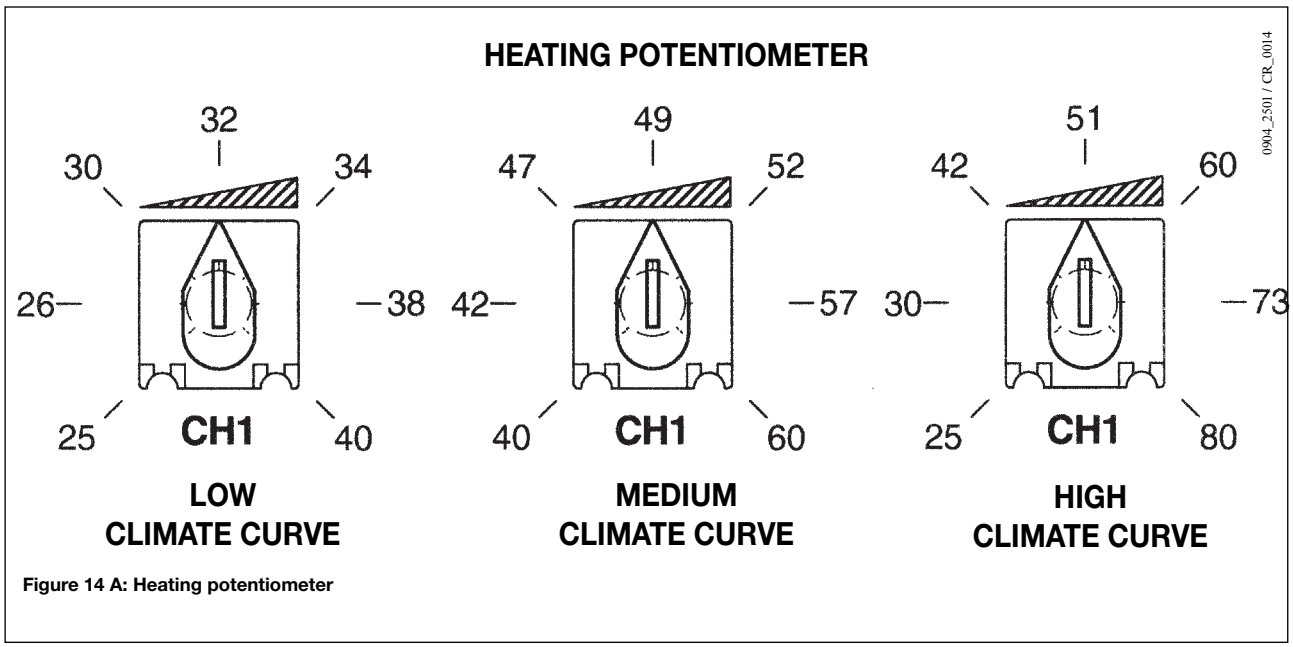


Figure 14 A: Heating potentiometer

TS = Domestic hot water (DHW) adjustment potentiometer
Adjusts domestic hot water temperature.
TS temperature range: 35 ÷ 65°C
Factory setting: 45°C

Attention: the DHW function is disabled in the first quarter of its travel; the anti-freeze function remains.

The electronic board is fitted with a special function that lowers the set DHW temperature if the temperature of the system water falls below the set value (Ts = Sys T – 5°C).

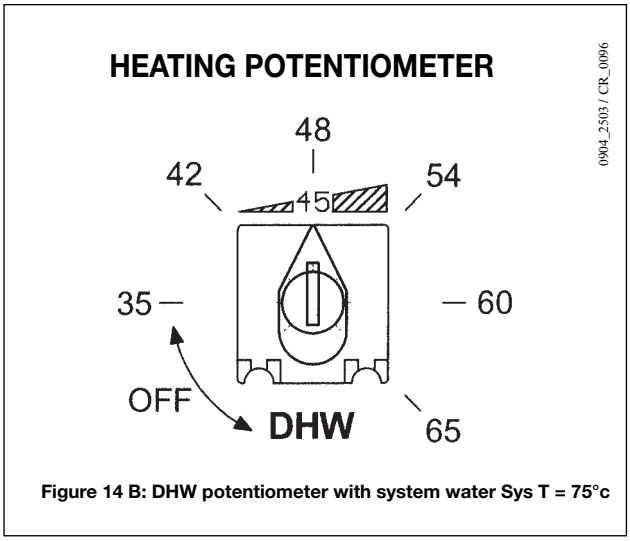


Figure 14 B: DHW potentiometer with system water Sys T = 75°c

SELECTORS 1 – 2 – 3 : USER MODULE CONFIGURATIONS

Model selection table

model	Switch 1	Switch 2	Switch 3
RA	OFF	OFF	ON
RA2Z	ON	ON	OFF

Make sure the switches are in the correct position for the model

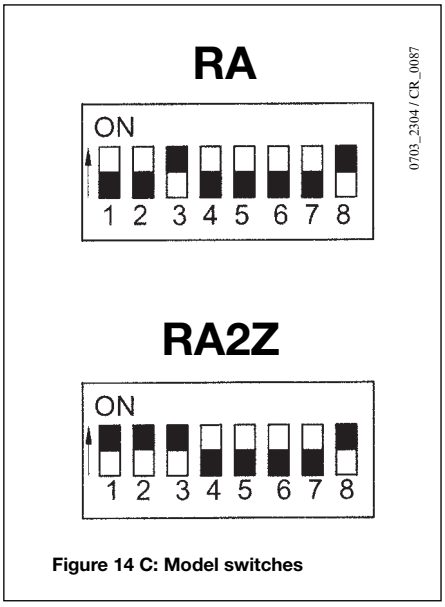


Figure 14 C: Model switches

SWITCHES 4 – 5 : CLIMATE CURVE SELECTION

Climate curve selection table

CLIMATE CURVE	Switch 4	Switch 5	Temperature range
LOW	OFF	OFF	25 ÷ 40 °C
MEDIUM	ON	OFF	50 ÷ 60 °C
HIGH (*)	OFF	ON	25 ÷ 80 °C

(*) factory setting

the high curve should be selected for heating elements at high temperatures: radiators
the medium curve should be selected for heating elements fitted with fans: fan coil units
the low curve should be selected for heating elements at low temperatures: underfloor or similar systems.

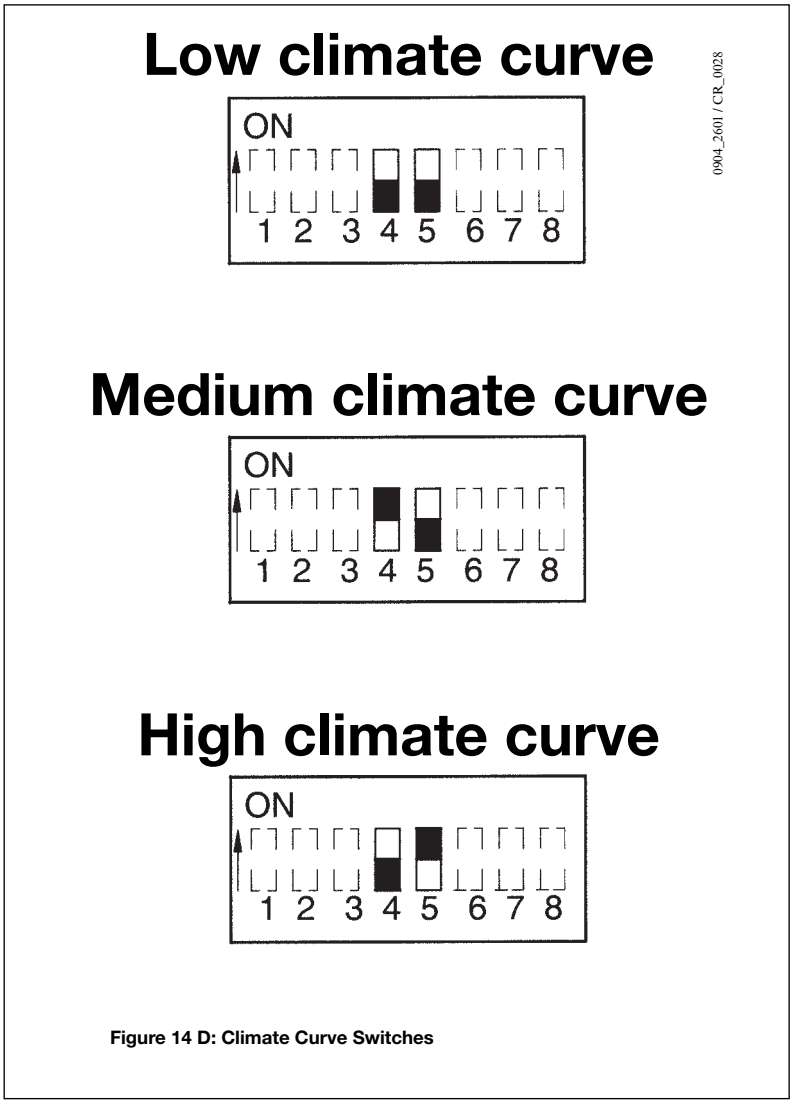


Figure 14 D: Climate Curve Switches

For dual-zone models (**RA2Z**), the choice of the climate curve only applies to the mixed zone. The other zone works directly with the temperature of the inlet water from the centralised system.

SWITCH 6: EXTERNAL PROBE ENABLE (only for models RSP-R2Z-RS2Z)

External probe enable table

EXTERNAL PROBE	Switch 6
With probe	ON
Without probe (*)	OFF

(*) factory setting

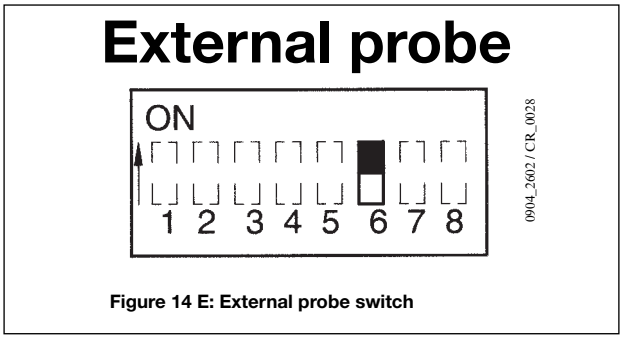


Figure 14 E: External probe switch

SELECTOR 7 : PUMP POST-CIRCULATION TIME

Pump post-circulation time selection table

POST-CIRCULATION TIME	Switch 7
4 HOURS	ON
5 MINUTES (*)	OFF

(*) factory setting

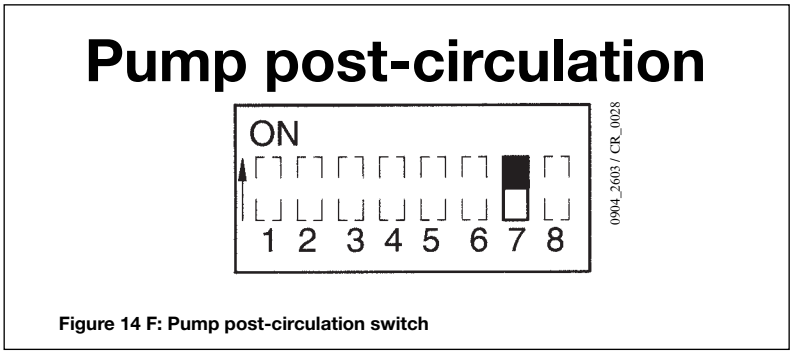


Figure 14 F: Pump post-circulation switch

SWITCH 8: ANTI-LEGIONELLOSIS FUNCTION

Anti-legionellosis function selection table

ANTI-LEGIONELLOSIS	Switch 8
ENABLED (*)	ON
DISABLED	OFF

(*) factory setting

With the anti-legionellosis function enabled, the system heats the storage boiler to a temperature of 65°C every seven days if the storage boiler has not been heated during that period of time.

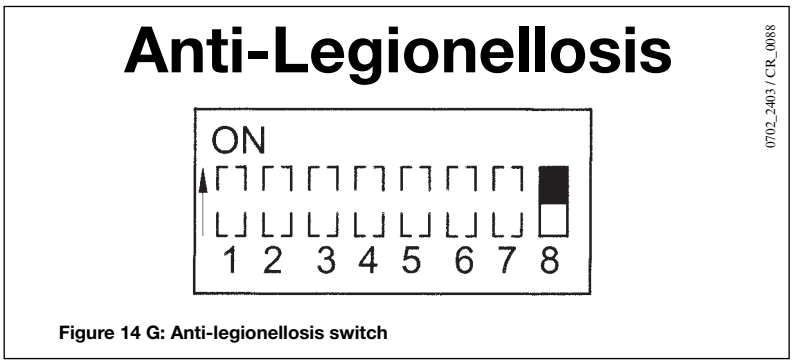


Figure 14 G: Anti-legionellosis switch

18. HEAT METERING

The modules are supplied standard with a **SIEMENS MEGATRON** electronic heat meter.
This device measures heat consumption in the zone controlled by the user module.
The electronic unit features an 8-digit LCD display. The 3 Vdc input voltage is provided by a lithium battery (lifetime 8 years). A button for querying the appliance is located on the front of the display. The appliance can be turned by 360° and inclined by 90°.
The appliance display has two levels with which the following information can be shown :

- Total power consumed since the last reading date.
- Segment test
- Current consumption
- Current flow rate
- Current delivery temperature
- Current return temperature
- Current T Delta between the two temperatures
- Operating hours since initial start-up
- Last reading date
- Last year's power consumption.
- Check code
- Total power consumption since installation
- Fault signals (consult the following section)

The units of measurement are °C or K, kWh, m³/h, kW, and hours.
The display shows total heating consumption by default.

Fault signals

The appliance automatically carries out diagnostic controls and displays the faults it finds. It divides the faults into two categories.

- Temporary faults that do not cause operating problems. In this case, the display flashes for 32 seconds and then resumes normal operation;
- Major faults that stop the appliance. In this case, the display alternatively indicates the fault code and the date on n which it appeared for the first time.

The flows metered up until that moment, remain memorised.

For further information, see the supplied **SIEMENS** instructions supplied with the meter.

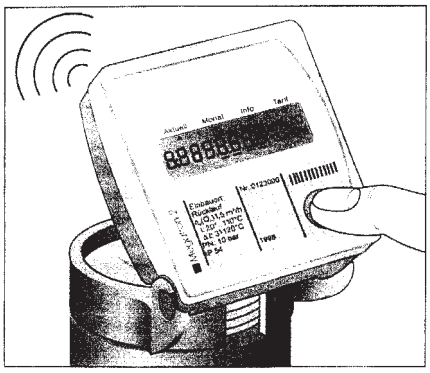


Figure 15: Meter display

Metering data can also be transmitted via radio to a remote reception device (Radio system expansion).

19. AUTOMATIC MEASUREMENT SYSTEM VIA RADIO

This system allows all the consumption data of the building to be handled from a single station, thus reducing measurement times whilst protecting user privacy. Transmission frequency is the 868 MHz established by the national radio transmission plan (European standard). The duration and power of the radio signal are irrelevant and are in no way connected with problems of “electro smog”.

The heat meters of the various user modules transmit consumption via a radio signal and the relative floor aerials (WTT16) which receive and save the data. Consumption can be read by connecting a Personal computer to any of the floor aerials via radio or making a cable connection to an aerial with a serial output or using a remote modem (GSM).

- Local reading via cable from the **WTT16.232** aerial with RS232 interface:
  via **PC** (with **ACS26** data reading software) connected with a serial cable (figure 16b case 1).
- Local reading via radio of the **WTT16** floor aerials:
  via **PC** (with **ACS26** data reading software) connected to the **WTZ.RM** radio module (figure 16b case 2).
- Remote reading via GSM from the **WTX16.GSM** Gateway aerial:
  Via **PC** (with **ACS26** reading software and GSM modem + phone card) (figure 16b case 3).

In certain cases, the following accessory components must be used:

- **WTT16 FLOOR AERIAL**
- **WTT16.232 AERIAL WITH SERIAL OUTPUT (local reading via PC)**
- **WTX16.GSM GATEWAY AERIAL (telephone reading via PC)**
- **SIEMECA WTZ.RM RADIO MODULE FOR PC (radio reading via PC)**
- **ACS26 READING SOFTWARE (for PC)**

During installation, no special start-up procedures are required for radio transmissions as all the system components are automatically configured for signal transmissions. These characteristics guarantee rapid, problem-free start-up and simple system management.

Install the Radio system according to the following parameters:

- Average reception capacity of WTT16 aerials: radius of 25 metres on the floor where they are installed and 15 metres on the floors above and below (install one WTT16 aerial every two floors).
- System capacity: max. 12 WTT16 aerials (or 11 WTT16 aerials + 1 GATEWAY WTX16 aerial) with max. reception of 500 meters.
- Lifetime of battery-operated WTT16 aerial: at least 6 years plus 1 reserve year during which a “battery low” message is sent
- Lifetime of heat meter: 6 years plus 15 reserve months
- The WTX16.GSM Gateway aerial must be powered at mains voltage.

The floor aerials (WTT16) must be fixed to a wall of the stairwell, at a height that prevents tampering, using the supplied expansion grip.
The Gateway aerial (WTX16.GSM) must be installed in the entrance area of the metered building (this component requires mains voltage input).

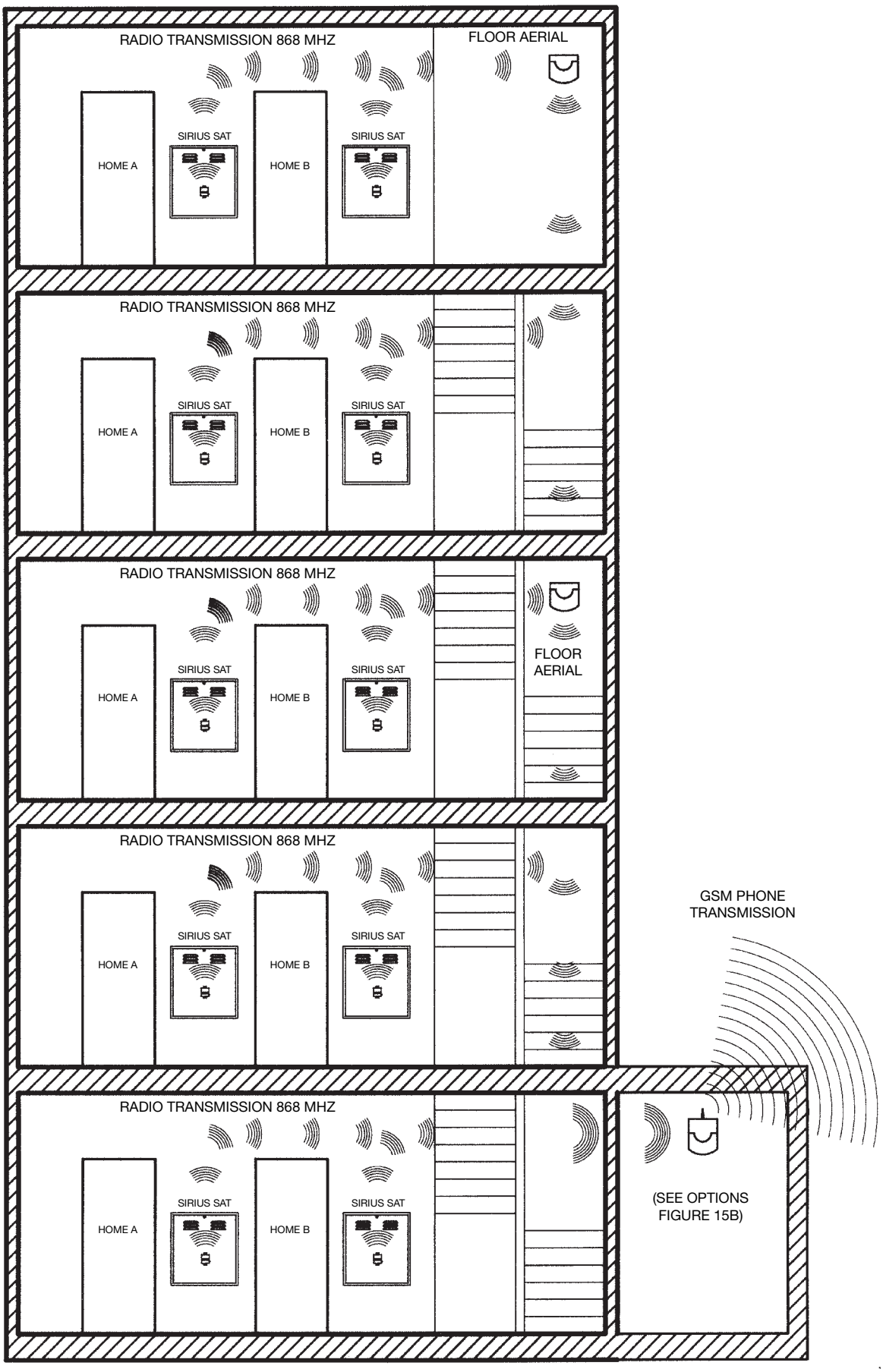
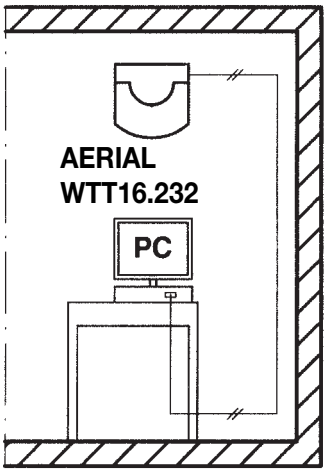


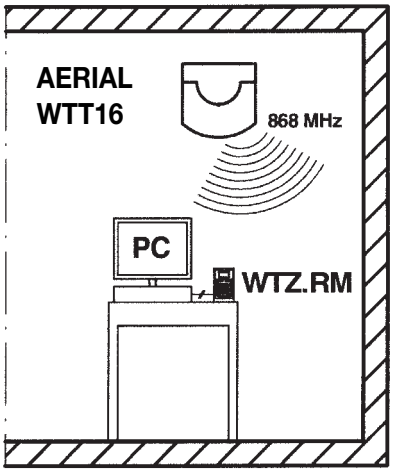
Figure 16 A: Automatic measurement system via radio

0904_2605 / CR_0033

1) LOCAL TRANSMISSION VIA “SERIAL LINE”



2) LOCAL TRANSMISSION VIA “RADIO”



3) TRANSMISSION VIA “GSM”

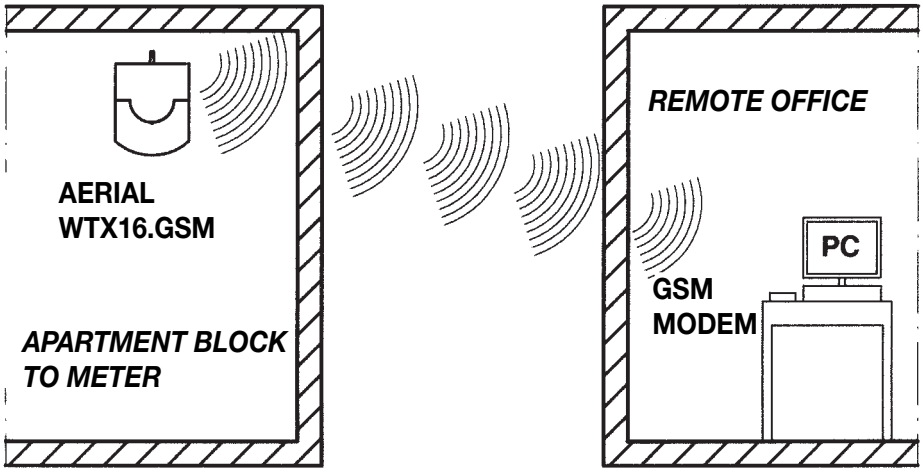


Figure 16 B: Measurement options

19.1 START-UP

Start-up of the radio system comprises several steps:

- Set the WTT16 aerials to the start-up mode (press the red MODE button on each WTT16 aerial).
- At this point, the WTT16 aerials configure themselves and automatically create a virtual communication network.
- Set the heat meter to the start-up mode by pressing the button on the front. After setting the mode, all the meters send a start-up signal to the WTT16 aerials.
- After receiving all the meters in the field, to compete system start-up, set the aerials to the standard mode (press the blue button on each WTT16 aerial).

19.2 OPERATING PROCEDURE

During automatic system operation, the WTT16 aerials and the GATEWAY WTX16.GSM aerial exchange the consumption data of the meters on a daily basis in order to allow each single aerial to store the data of the entire building. The data of the entire building can be manually updated without having to wait for the daily exchange routine.

19.3 DATA FORMAT

Consumption data is coded in XML format or in ASCII code to that it can be processed by any editor (Notepad, Excel, etc.).

For further information, read the manuals of the individual components.

20. FILLING THE SYSTEM

Before starting the user module, open the on/off valves on the hydraulic connectors and check the system filling pressure in the boiler room and distribution columns (< 3 bar).

The centralised plant must have an automatic filling device.

21. AIR VENT AND PUMP RESET

21.1 AIR VENT

In the first plant filling operation, vent any air in the system, including the user module. The appliance is fitted with an automatic air vent valve.

21.2 PUMP RESET

The user module is fitted with a pump reset device which, if no heat demand (heating and/or domestic water) is received for 24 consecutive hours, automatically runs the pump for one minute. This function is operative if the system is powered.

If, however, the pump/s need/s to be reset after a period of inactivity or during initial starting, simply remove the cap screwed onto the shaft, insert a screwdriver and turn the rotor a few times in order to reset it and allow it to start.
Collect the water flowing from the pump shaft.

22. OPERATING PROCEDURE

22.1 STARTING

To start the appliance correctly, proceed as follows:

- Power the module.
- Check that the system is full and at the right pressure (see § 20) and temperature (65 ÷ 75°C).
- Check that the electronic board switches are in the correct position (see § 17).
- Press the luminous switch on the cover of the electrical box.
- Adjust the ambient thermostat (or the climate adjustor) to the required temperature.

Following a heat demand from the ambient thermostat, the water from the centralised system begins to circulate in the heating elements of the zone controlled by the user module.

For dual-zone models (**RA2Z**) the heating bands of two zones can be managed separately by the relative ambient thermostats (or with the **ECO CRONO** climate adjustor).

The user module heats the water in the storage boiler to the temperature set by the relative **DHW potentiometer. TS temperature range: 35 ÷ 65°C** (see § 17).

Whenever the temperature of the water in the storage boiler falls below the set value, the module serves the storage boiler interrupting operation in the heating mode (DHW priority).

Different adjustments of domestic hot water temperature can be made directly using the **ECO CRONO** climate adjuster.

22.2 PARTIAL SHUT-DOWN

Adjust the ambient thermostat / heating programmer / **ECO CRONO** climate adjuster to disable the heating function (lower the set ambient temperature or disable heating). The domestic hot water function and the frost protection device remain active.

22.3 TOTAL SHUT-DOWN

Disconnect the appliance from the power supply by turning the luminous switch and the two-pole switch.

23. ELECTRONIC BOARD SIGNALS

The LED's on the electronic board display the operating status and any system blocks.

Key to LED's:

LED	*COLOUR*	*LED STATUS*	*OPERATING STATUS*
DL1	**RED**	**OFF**	NO ALARMS
DL1	**RED**	***FLASHING*** ***1 FLASH EVERY 3S***	EXTERNAL PROBE FAULTY
DL1	**RED**	***FLASHING*** **2 FLASHES EVERY 1S**	DOMESTIC HOT WATER PROBE FAULTY
DL1	**RED**	**FLASHING** **3 FLASHES EVERY 1S**	HEATING PROBE FAULTY
DL1	**RED**	***ON***	ON/OFF VALVE NOT OPEN (Y1)
DL2	**GREEN**	**OFF**	NO POWER
DL2	**GREEN**	**ON**	ZONE I HEAT DEMAND (MIXED)
DL2	**GREEN**	**FLASHING 0.5S**	POWER ON (AMBIENT THERMOSTAT NOT OPEN)
DL2	**GREEN**	**FLASHING 5S**	POWER ON (AMBIENT THERMOSTAT OPEN)
DL3	**GREEN**	**ON**	ZONE II PUMP FEED (HIGH TEMPERATURE)
DL4	**GREEN**	**ON**	ZONE 1 PUMP FEED (MIXED)
DL5	**GREEN**	**ON**	ON/OFF VALVE SERVOMOTOR POWER INPUT
DL6	**GREEN**	**ON**	DHW RECIRCULATION PUMP
DL7	**GREEN**	**ON**	ZONE II VALVE OPEN (Y4)
DL8	**RED**	***ON***	THREE-WAY VALVE IN DHW MODE (Y3)
DL9	**GREEN**	**ON**	THREE-WAY VALVE IN HEATING MODE (Y3)
DL10	**GREEN**	**ON**	DOMESTIC HOT WATER DEMAND
DL11	**GREEN**	**ON**	ON/OFF VALVE OPEN (AT TRAVEL STOP)
DL12	**RED**	**ON**	SAFETY THERMOSTAT TRIPPED (*)
DL12	**RED**	**FLASHING**	AFTER SAFETY THERMOSTAT RESET (*)
DL13	**GREEN**	**ON**	ZONE II HEAT DEMAND

(*) Safety thermostat tripping
If the safety thermostat trips due to a fault in the adjustment system, the user module stops for safety reasons and the **red LED DL12** shines on the electronic board.
After checking the reason for the overheating, restart the system by pressing the safety thermostat reset device and momentarily disconnecting the power supply from the module (this operation is required in order to cancel the block from the board memory: the **red LED DL12 flashes**).
In case this device trips repeatedly, contact the technical assistance service.

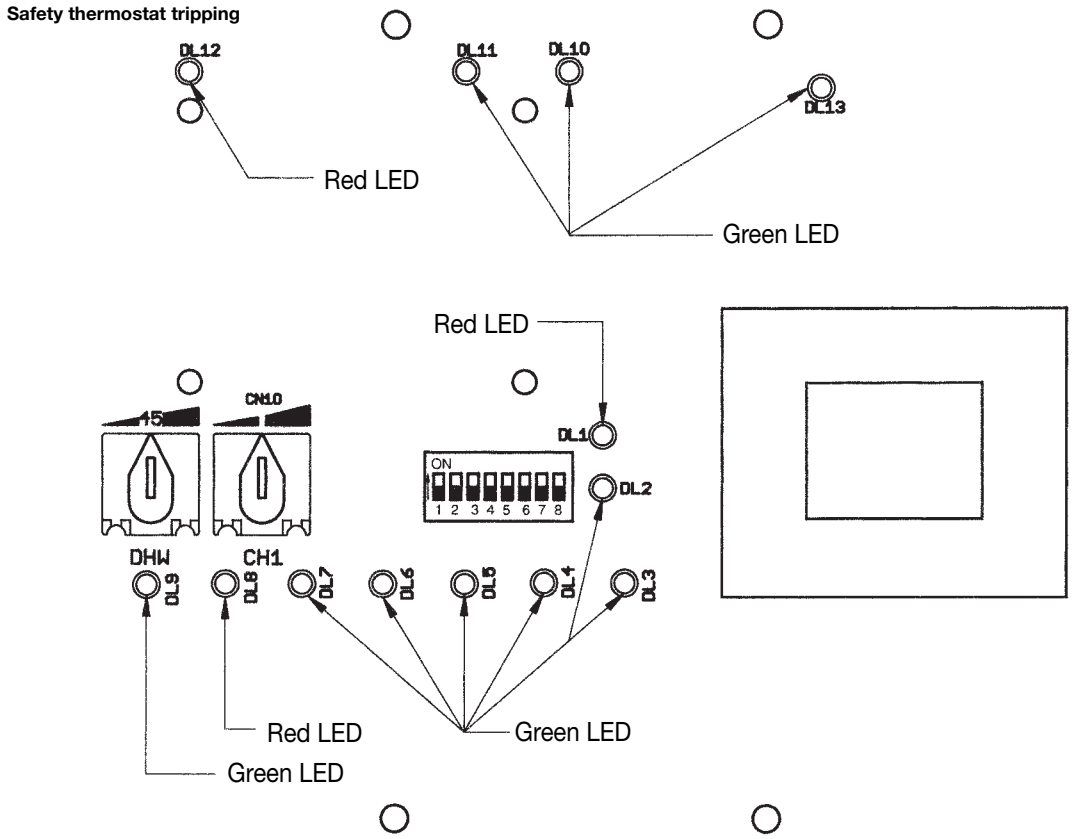


Figure 17: Electronic board signals

For regular and cost-effective operation of the user modules, they must be periodically checked and overhauled approximately once every two years.

To clean the storage boiler (removing scale from the exchanger coil) consult the instructions manual of the appliance.

24. CLEANING THE HEATING INLET FILTER

These appliances are fitted with a heating water filter on the water inlet line coming from the centralised plant.
To clean, proceed as follows:

- Close all the on/off taps on the hydraulic connectors of the module;
- Drain the heating circuit;
- Unscrew the cap at the top of the filter, remove the internal cylinder cartridge and eliminate any impurities.

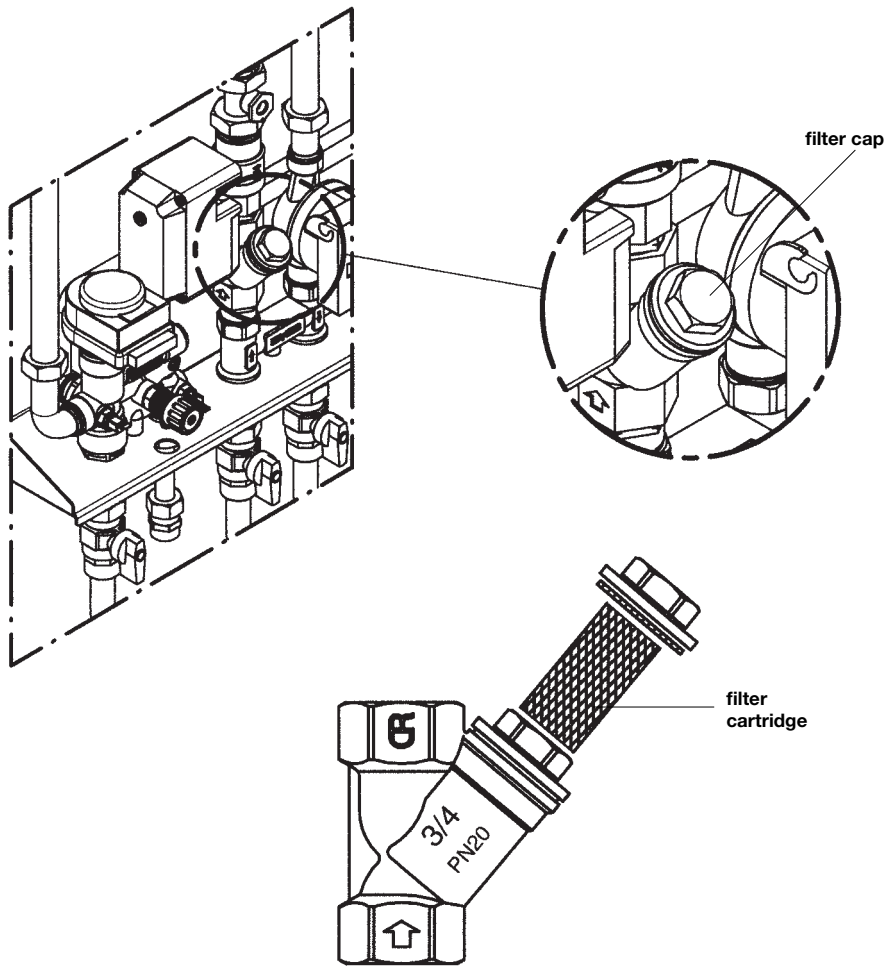
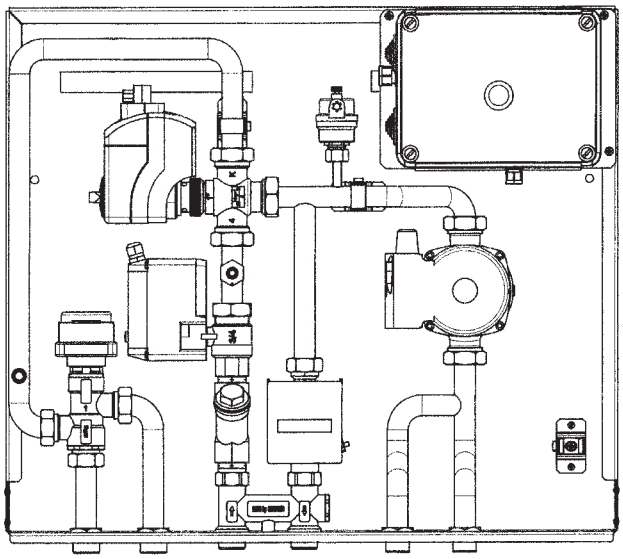


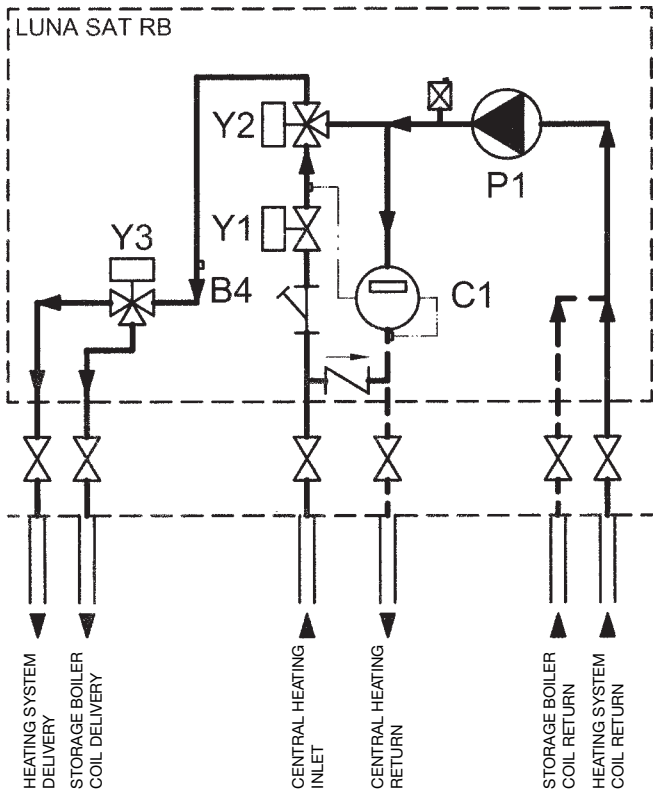
Figure 18: Dismounting the heating circuit filter

25. FUNCTIONAL CIRCUIT DIAGRAM

25.1 MODEL RA

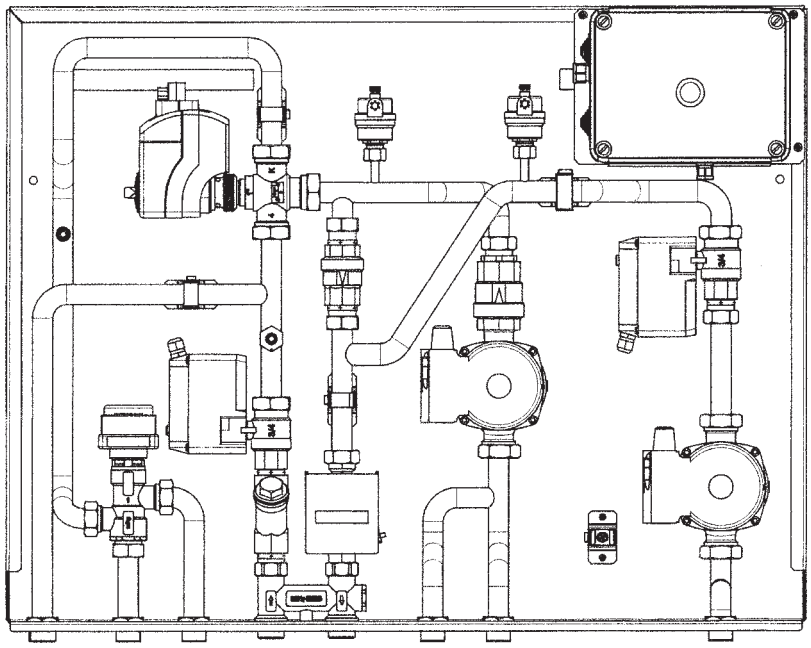


0904_2702 / CR_0085

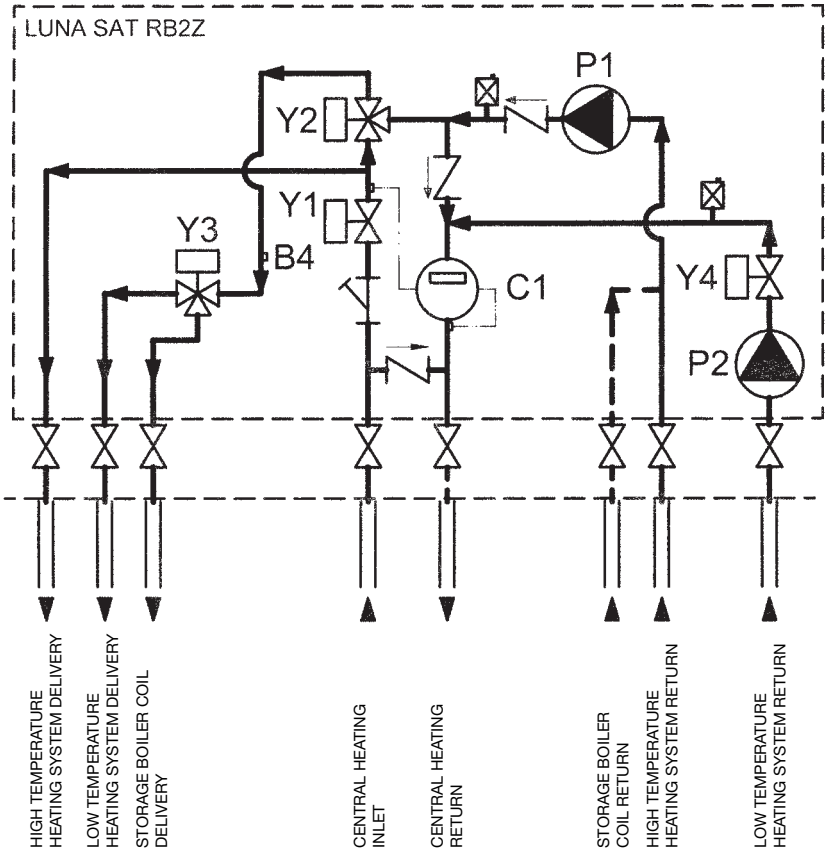


Key
Y1 ON-OFF valve
Y2 Mixing valve
Y3 3-way valve DHW/heating
P1 Heating - storage boiler pump
C1 Meter
B4 NTC heating probe

25.2 MODEL RA2Z



0904_2703 / CR_0086



Key
Y1 ON-OFF valve
Y2 Mixing valve
Y3 3-way valve DHW/heating
Y4 ON-OFF valve
P1 Low temperature heating pump
P2 High temperature heating pump
C1 Meter
B4 NTC heating probe

Mixed Sources
Product group from well-managed forests, controlled sources and recycled wood or fiber
www.fsc.org Cert no. SGS-COC-004012
© 1996 Forest Stewardship Council
FSC

PART OF BDR THERMEA

Baxi Commercial Division
Wood Lane, Erdington,
Birmingham B24 9QP
Email: andrews@baxigroup.com
www.andrewswaterheaters.co.uk

Sales:
0845 070 1056

Technical:
0845 070 1057

POTTERTON
COMMERCIAL
heating specialists